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## Drinking Water Surveillance Program

# KITCHENER WATER SUPPLY SYSTEM

Annual Report 1987

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**KITCHENER  
WATER SUPPLY SYSTEM**

**DRINKING WATER SURVEILLANCE  
PROGRAM**

**ANNUAL REPORT 1987**

**ONTARIO MINISTRY OF ENVIRONMENT  
OCTOBER 1988**

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### ACKNOWLEDGEMENTS

The Drinking Water Surveillance Program (DWSP) employs a team approach requiring the co-operative effort of the Ministry of the Environment (MOE) staff from Water Resources and Laboratory Services Branch and the Regions, as well as plant operational staff from the Municipalities.

This annual report was produced by the DWSP Group (Ron Hunsinger, Peter Bohm, Carol Sackville-Duyvelshoff, Chris Fung and John McGrachan) and by Pat Lachmaniuk (on developmental assignment to the Drinking Water Section). Helpful input and reviews were received from Drinking Water Section Staff, in addition to reviews by other MOE and municipal personnel.

## EXECUTIVE SUMMARY

### DRINKING WATER SURVEILLANCE PROGRAM KITCHENER WATER SUPPLY 1987 ANNUAL REPORT

The Drinking Water Surveillance Program (DWSP) for Ontario is a monitoring program providing immediate, reliable, current information on drinking water quality. The DWSP officially began in April 1986 and is designed to eventually include all municipal supplies in Ontario. Currently, 44 plants are being monitored.

The Kitchener Water Supply source consists of many wells. Three locations were sampled on the DWSP. The locations were K70 recharge well which receives recharged water from the Grand River, K21 wells supplying the Mannheim Reservoir and the third location was the treated water from the Strange Street Reservoir which contains a mixture of water from various well sources. The only treatment process applied to this water is disinfection.

Water samples were taken on a monthly basis at all locations except for the Strange Street Reservoir which was shut down for maintenance for part of the year. The Kitchener Water Supply was sampled, for approximately 160 parameters, monthly from March, 1987. Parameters were divided into the following groups: Bacteriological, Inorganic and Physical (Laboratory Chemistry, Field Chemistry and Metals) and Organic (Chloroaromatics, Chlorophenols, Pesticides and PCB, Phenolics, Polynuclear Aromatic Hydrocarbons, Specific Pesticides and Volatiles). Chlorophenols and Specific Pesticides were analysed for in June and November only.

A summary of results is shown in Table 1.

Due to its sampling frequency of once per month, the DWSP is not designed to evaluate all aspects of the bacteriological quality of water; however routine bacteriological monitoring as outlined in the Ontario Drinking Water Objectives (ODWOs) is carried out by the operating authority. In terms of the limited DWSP bacteriological examination the water was of good quality.

Inorganic and Physical parameters were below any applicable health related ODWOs.

Of a total of approximately 110 Organic parameters tested for on a monthly basis, none exceeded health related guidelines.

Many of the substances analysed for were naturally-occurring or treatment by-products.

During 1987 the DWSP sampling results indicated that the Kitchener Water Supply produced good quality water at the plant.

## SOMMAIRE

### PROGRAMME DE SURVEILLANCE DE L'EAU POTABLE

#### RÉSEAU D'ALIMENTATION EN EAU DE KITCHENER RAPPORT ANNUEL 1987

Le Programme de surveillance de l'eau potable (PSEP) de l'Ontario fournit des informations immédiates, fiables et à jour sur la qualité de l'eau potable. Le PSEP a débuté officiellement en avril 1986. Il est destiné à englober tous les réseaux municipaux d'alimentation en eau de l'Ontario. Actuellement, 44 stations en font partie.

Le réseau d'alimentation en eau de Kitchener consiste en de nombreux puits. Dans le cadre du PSEP, des prélèvements ont été effectués à trois endroits : au puits de réalimentation K70 (qui reçoit l'eau reconstituée de la rivière Grand), aux puits K21 alimentant le réservoir de Mannheim et au réservoir de la rue Strange, qui contient de l'eau traitée de différents puits. Le seul traitement appliqué à cette eau est la désinfection.

Des prélèvements ont été effectués chaque mois aux trois endroits, sauf dans le réservoir de la rue Strange fermé une partie de l'année pour entretien. À partir de mars 1987, des prélèvements ont été effectués chaque mois et analysés par rapport à environ 160 paramètres dans les catégories suivantes : bactériologique, inorganique et physique (analyses en laboratoire et sur place, présence de métaux) et organique (composés aromatiques chlorés, chlorophénols, pesticides et BPC, dérivés phénoliques, hydrocarbures aromatiques polynucléaires, pesticides particuliers et composés volatils). Les chlorophénols et les pesticides particuliers n'ont été analysés qu'en juin et en novembre.

Le tableau 1 résume les résultats obtenus.

En raison de la fréquence des prélèvements (un par mois), le PSEP ne permet pas d'évaluer tous les aspects de la qualité bactériologique de l'eau. Cependant, comme on le recommande dans le cadre des objectifs relatifs à la qualité de l'eau potable en Ontario, un contrôle bactériologique systématique est effectué par l'exploitant. L'analyse bactériologique limitée du PSEP a révélé une eau de bonne qualité.

Les mesures des paramètres inorganiques et physiques étaient inférieures aux limites applicables fixées par l'Ontario pour l'eau potable.

Pour environ 110 paramètres organiques mesurés chaque mois, aucun résultat n'a dépassé les limites acceptables fixées pour la santé.

Un grand nombre de substances détectées apparaissent naturellement ou sont des produits dérivés de l'épuration.

Les résultats des analyses effectuées en 1987 dans le cadre du PSEP ont indiqué que le réseau d'alimentation en eau de Kitchener donnait une eau de bonne qualité.

TABLE 1

DRINKING WATER SURVEILLANCE PROGRAM K 70 RECHARGE WELL, KITCHENER

## SUMMARY TABLE BY SCAN (1987)

| SCAN                | RAW   |          |           | TREATED |          |           |
|---------------------|-------|----------|-----------|---------|----------|-----------|
|                     | TESTS | POSITIVE | %POSITIVE | TESTS   | POSITIVE | %POSITIVE |
| BACTERIOLOGICAL     | 39    | 14       | 35        | 43      | 9        | 20        |
| CHEMISTRY (FLD)     | 20    | 20       | 100       | 49      | 49       | 100       |
| CHEMISTRY (LAB)     | 189   | 146      | 77        | 189     | 151      | 79        |
| METALS              | 201   | 87       | 43        | 201     | 88       | 43        |
| CHLOROAROMATICS     | 130   | 0        | 0         | 130     | 0        | 0         |
| CHLOROPHENOLS       | 12    | 0        | 0         | 12      | 0        | 0         |
| PAH                 | 34    | 0        | 0         | 34      | 0        | 0         |
| PESTICIDES & PCB    | 247   | 0        | 0         | 247     | 0        | 0         |
| PHENOLICS           | 10    | 1        | 10        | 10      | 1        | 10        |
| SPECIFIC PESTICIDES | 134   | 0        | 0         | 134     | 0        | 0         |
| VOLATILES           | 279   | 3        | 1         | 280     | 32       | 11        |
| TOTAL               | 1295  | 271      |           | 1329    | 330      |           |

NO HEALTH RELATED GUIDELINES/LIMITS WERE EXCEEDED

A POSITIVE VALUE DENOTES THAT THE RESULT IS GREATER THAN THE STATISTICAL LIMIT OF DETECTION AND IS QUANTIFIABLE

A ' ' INDICATES THAT NO SAMPLE WAS TAKEN

TABLE 1

DRINKING WATER SURVEILLANCE PROGRAM     KITCHENER WELL SUPPLY K21, MANNHEIM RES

## SUMMARY TABLE BY SCAN (1987)

| SCAN                | RAW   |          |           | TREATED |          |           |
|---------------------|-------|----------|-----------|---------|----------|-----------|
|                     | TESTS | POSITIVE | %POSITIVE | TESTS   | POSITIVE | %POSITIVE |
| BACTERIOLOGICAL     | 43    | 14       | 32        | 47      | 13       | 27        |
| CHEMISTRY (FLD)     | 22    | 22       | 100       | 35      | 35       | 100       |
| CHEMISTRY (LAB)     | 208   | 142      | 68        | 188     | 123      | 65        |
| METALS              | 221   | 109      | 49        | 221     | 103      | 46        |
| CHLOROAROMATICS     | 130   | 0        | 0         | 143     | 0        | 0         |
| CHLOROPHENOLS       | 6     | 0        | 0         | 12      | 0        | 0         |
| PAH                 | 51    | 0        | 0         | 51      | 0        | 0         |
| PESTICIDES & PCB    | 250   | 0        | 0         | 272     | 0        | 0         |
| PHENOLICS           | 11    | 1        | 9         | 9       | 1        | 11        |
| SPECIFIC PESTICIDES | 138   | 0        | 0         | 144     | 0        | 0         |
| VOLATILES           | 307   | 1        | 0         | 308     | 16       | 5         |
| TOTAL               | 1387  | 289      |           | 1430    | 291      |           |

NO HEALTH RELATED GUIDELINES/LIMITS WERE EXCEEDED

A POSITIVE VALUE DENOTES THAT THE RESULT IS GREATER THAN THE STATISTICAL LIMIT OF DETECTION AND IS QUANTIFIABLE

A '0' INDICATES THAT NO SAMPLE WAS TAKEN

TABLE 1

DRINKING WATER SURVEILLANCE PROGRAM      STRANGE STREET RESERVOIR, KITCHENER

## SUMMARY TABLE BY SCAN (1987)

| SCAN                | TREATED |          |           |
|---------------------|---------|----------|-----------|
|                     | TESTS   | POSITIVE | %POSITIVE |
| BACTERIOLOGICAL     | 30      | 6        | 20        |
| CHEMISTRY (FLD)     | 29      | 29       | 100       |
| CHEMISTRY (LAB)     | 150     | 104      | 69        |
| METALS              | 162     | 78       | 48        |
| CHLOROAROMATICS     | 104     | 0        | 0         |
| CHLOROPHENOLS       | 6       | 0        | 0         |
| PAH                 | 34      | 6        | 17        |
| PESTICIDES & PCB    | 198     | 0        | 0         |
| PHENOLICS           | 8       | 1        | 12        |
| SPECIFIC PESTICIDES | 99      | 0        | 0         |
| VOLATILES           | 225     | 32       | 14        |
| TOTAL               | 1045    | 256      |           |

NO HEALTH RELATED GUIDELINES/LIMITS WERE EXCEEDED

A POSITIVE VALUE DENOTES THAT THE RESULT IS GREATER THAN THE STATISTICAL LIMIT OF DETECTION AND IS QUANTIFIABLE

A '-' INDICATES THAT NO SAMPLE WAS TAKEN

## DRINKING WATER SURVEILLANCE PROGRAM

### KITCHENER WATER SUPPLY 1987 ANNUAL REPORT

#### INTRODUCTION

The Drinking Water Surveillance Program (DWSP) for Ontario is a monitoring program providing immediate, reliable, current information on drinking water quality. The DWSP officially began in April 1986 and is designed to eventually include all municipal supplies in Ontario. Currently, 44 plants are being monitored. Appendix A contains a detailed description of the DWSP.

The DWSP was initiated in Kitchener in the spring of 1987.

This report contains information and results for 1987.

#### PLANT DESCRIPTION

The Kitchener Well Supply consists of many wells. The DWSP samples water from only two wells, each being a different type. K70 is a recharge well which receives water through the soil adjacent to and hydrogeologically connected to the Grand River. This water is disinfected with a mixture of sodium hypochlorite and sodium chlorite prior to distribution. The K70 Recharge Well has daily flows ranging from 2.1 to 3.8 x 1000m<sup>3</sup>/day. The second well, K21, is an underground aquifer source. The treated water

sampled from the K21 source is a mixture of chlorinated water from six wells. The water collects in the Mannheim Reservoir prior to sampling. The Mannheim Reservoir has daily flows ranging from 22.5 to 39.8 x 1000m<sup>3</sup>/day. The third source, the Strange Street Reservoir, is again a mixture of chlorinated water from many wells. Only a treated sample is available from this site. The Strange Street Reservoir has daily flows ranging from 5.1 to 12.8 x 1000m<sup>3</sup>/day.

The Kitchener Well Supply serves a population of approximately 144,000 people.

The sample location is shown in Figure 1. General information is presented in Table 2.

#### METHODS

Water samples were obtained from five DWSP approved locations;

- i) Raw K70 - The water originated from the pump suction line prior to chlorination and was sampled through a copper sample line. The sample tap is located by the pump.
- ii) Treated K70 - The water originated from the pump discharge following chlorination and was sampled through a copper sample line. The sample tap is located by the pump.
- iii) Raw Mannheim Reservoir - The water originated from the pump discharge and was sampled through a



copper sample line. The sample tap is located by the pump.

iv) Treated Mannheim Reservoir- The water originated from the highlift pump discharge and was sampled through a copper sample line. The sample tap is located near the pump in the reservoir building.

v) Treated Strange Street Reservoir - The water originated from the highlift discharge and was sampled through a copper sample line. The tap is located by the highlift pump.

Sample lines in the plant were flushed prior to sampling to ensure that the water obtained was indicative of its origin and not residual water standing in the sample line.

Stringent DWSP sampling protocols were followed to eliminate any variance (Appendix B).

With respect to the well samples in Kitchener, the retention time was not followed.

Sample day flow, treatment chemical dosages and field measurements such as Turbidity, Chlorine Residuals, pH and Temperature were recorded on the day of sampling and were entered onto the DWSP data base as submitted.

FIGURE 1

DRINKING WATER SURVEILLANCE PROGRAM ANNUAL REPORT

SITE LOCATION MAP

LOCATION: KITCHENER WATER SUPPLY



TABLE 2

DRINKING WATER SURVEILLANCE PROGRAM ANNUAL REPORTGENERAL INFORMATIONKITCHENER WELL SUPPLY

LOCATION: REGIONAL MUNICIPALITY OF WATERLOO  
C/O MARSLAND CENTER  
20 ERB STREET WEST  
WATERLOO, ONTARIO  
N2J 4G7

SOURCE: RAW WATER SOURCE - GRAND RIVER  
MANNHEIM RESERVOIR  
STRANGE STREET RESERVOIR

DESIGN CAPACITY: 22 X 1000M3/DAY

OPERATION: MUNICIPALITY

SYSTEM MANAGER: R. MACDONALD

MINISTRY REGION: WEST CENTRAL

DISTRICT OFFICER: D.R. IRELAND

MUNICIPALITY  
SERVED

POPULATION

KITCHENER/WATERLOO

155,000

## RESULTS

The Kitchener Well Supply locations were sampled for approximately 160 parameters on a monthly basis starting in March. No samples were available while the Strange Street Reservoir was out of service for the completion of maintenance work.

The Specific Pesticides and Chlorophenols scans were sampled for in June and November only.

Table 3 contains information on the sample day retention time, flow rate and treatment chemicals used and their associated dosages.

Table 4 is a summary break-down of the number of water samples analysed for by parameter and by water type. The number of times that a positive or trace result was detected is also reported.

Positive denotes that the result is greater than the statistical limit of detection established by the Ministry of the Environment (MOE) laboratory staff and is quantifiable. Trace (<T) denotes that the level measured is greater than the lowest value detectable by the method but lies so close to the detection limit that it cannot be confidently quantified.

Table 5 presents the results for parameters detected on at least one occasion.

Table 6 presents parameters not detected.

Associated guidelines and detection limits are also supplied on both tables. Parameters are listed alphabetically within each scan.

## DISCUSSION

### General

Water quality is judged by comparison with the Ontario Drinking Water Objectives (ODWOs) as defined in the 1984 publication (ISBN 0-7743-8985-0). The Province of Ontario has health related and aesthetic objectives for 49 parameters, these are currently under review. When an ODWO is not available guidelines/limits from other agencies are consulted. The Parameters Listing System (PALIS) recently initiated by the MOE catalogues and keeps current over 1750 guidelines for 650 parameters from agencies throughout the world.

As stated under Results, traces do not indicate quantifiable results as defined by established MOE laboratory analytical reporting protocols. While they can be useful in trend analysis or confirmation of the presence of a specific contaminant that is repeatedly detected at these levels, the occasional finding of a trace level of a contaminant is not considered to be

significant. DISCUSSION OF GUIDELINES AND LIMITS THEREFORE, IS ONLY CONDUCTED ON POSITIVE RESULTS.

#### Bacteriology

Positive results for the Bacteriology scan were present nine times in the treated K70 water, thirteen times in the treated Mannheim Reservoir water and six times in the Strange Street Reservoir water. In all cases, the positive parameters were Standard Plate Count, Total Coliform and/or Total Coliform Background.

Standard Plate Count results from all treated waters are uniformly low, indicating generally good microbiological quality.

Due to its sampling frequency of once per month, the DWSP is not designed to evaluate all aspects of the bacteriological quality of water. Routine bacteriological monitoring as recommended in the ODWOs is carried out by the operating authority. Water from the Kitchener Well Supply, in terms of the limited DWSP bacteriological examination, was of good quality.

#### Inorganic and Physical

##### **Laboratory and Field Chemistry**

The results for the Laboratory Chemistry and Field Chemistry scans were below all applicable health related ODWOs.

There are ODWOs that are set for parameters which are related to aesthetic quality rather than health. Hard water is undesirable because of a tendency to form scale deposits when heated and result in excessive soap consumption. High hardness values are usually associated with ground water sources. All three sources of water sampled contained hardness values above 200 mg/L as CaCO<sub>3</sub>.

Some European Economic Community (EEC) guidelines for parameters related to hardness ie. Conductivity and Calcium, were also exceeded in some samples as a result of the high hardness levels.

The aesthetic ODWO for Total Residue was exceeded at the Strange Street reservoir only, reflecting the highly mineralized nature of the water. This may affect palatability.

Organic Nitrogen is calculated by subtracting the Ammonia value (Ammonia Total) from the Total Kjeldahl Nitrogen value (Nitrogen Tot Kjeld). In a number of treated water samples from the K70 source Organic Nitrogen values exceeded the aesthetic ODWO of 0.15 mg/L. When Organic Nitrogen exceeds 0.15 mg/l in treated water some taste and odour problems may result.

This guideline is exceeded in most supplies. Based on the information obtained from the DWSP, which generally indicates no problems with this parameter exceedence, the guideline may be modified when the ODWOs are reviewed.

Colour values exceeded the aesthetic ODWO of 5 True Colour Units (TCU) in one treated water sample from the K70 source. Colour in drinking water may be due to the presence of natural or synthetic organic substances as well as certain metallic ions.

It is desirable that the Temperature of drinking water be less than 15°C; the palatability of water is enhanced by its coolness. A temperature below 15°C will tend to reduce the growth of nuisance organisms and hence minimize associated taste, colour, odour and corrosion problems. The desired ODWO was exceeded in the July, August and September samples of the K70 source raw and treated waters.

#### **Metals**

The results reported for the Metals scan were below any applicable health related ODWOs.

Copper levels were slightly elevated in the treated water from the K70 source as compared to the raw water indicating that small quantities of these metals were leached from the copper sample line.

The aesthetic ODWO of 0.05 mg/L for Manganese was exceeded seven times in the Strange Street Reservoir treated water. Manganese, at concentrations greater than 0.05 mg/L, is objectionable in water supplies because it stains laundry, and may cause an undesirable taste in beverages.



## Organic Parameters

### **Chloroaromatics**

The results of the Chloroaromatics scan showed that three parameters were detected:

1,2,4 Trichlorobenzene

Hexachloroethane

1,2,4,5 Tetrachlorobenzene

1,2,4 Trichlorobenzene was detected at a trace level, once in the Strange Street Reservoir treated water.

Hexachloroethane was detected at trace levels, once in the raw K70 recharge water and once in the treated Mannheim Reservoir.

1,2,4,5 Tetrachlorobenzene was detected at a trace level, once in the treated Mannheim Reservoir.

Review of these results, along with information from other water supplies on DWSP, would indicate that certain Chloroaromatics appear more frequently in the treated water than in the raw and almost always only at trace levels. These occurrences could possibly be due to a reaction of chlorine with organics present in the water or in the distribution system.

### **Chlorophenols**

The results of the Chlorophenols scan showed that no chlorophenols were detected.

### **Pesticides and PCB (Polychlorinated Biphenyl)**

The results of the Pesticides and PCB scan showed that two pesticides were detected:

Alpha BHC

Lindane

Lindane consists of several isomers of BHC (Benzene Hexachloride). Alpha BHC is the isomer predominantly found in water from the Great Lakes Basin as indicated in results from other water supplies on DWSP.

Alpha BHC was detected at a trace level, once in the treated Mannheim Reservoir.

Lindane was detected at a trace level, once in the treated Mannheim Reservoir.

### **Specific Pesticides**

Results of the Specific Pesticides scan showed that three parameters were detected:

Atrazine

Bladex

Prometone

Atrazine was detected at trace levels, three times in the K70 raw water, four times in the treated water, and once in the K21 raw water.

Bladex was detected at a trace level, once in the K21 raw water.

Prometone was detected at a trace level, once in the K21 raw water.

#### **Phenolics**

Phenolics were detected at trace levels, twice in the raw and treated water from K70, four times in the raw water from K21 and once in both the treated Mannheim Reservoir and Strange Street Reservoir. Positive values were found in April for the K70 raw and treated water, the K21 raw water and the treated Mannheim Reservoir. The laboratory suspected contamination as indicated by the remark code "CIC". Phenolic compounds are present in the aquatic environment as a result of natural/and or industrial processes.

#### **Polynuclear Aromatic Hydrocarbons (PAH)**

The results of the PAH scan showed that three PAHs were detected:

Fluoranthene

Pyrene

Benzo(K)Fluoranthene

Fluoranthene was detected at 20 and 30 ng/L in the August and October samples from the Strange Street Reservoir. This is below the United States Environmental Protection Agency's (EPA) Ambient Water Quality (AWQ) guideline of 42000 ng/L. AWQ guidelines are designed to ensure that the surface water, used as a drinking

water source and from which fish are consumed, does not contain substances at levels that would be hazardous to human health. Since both water and fish consumption are considered, AWQ guidelines are usually more stringent than any corresponding drinking water guideline. The positive occurrences were well below the AWQ guideline.

Pyrene was detected at 40 ng/L in the August and October samples from the Strange Street Reservoir. At present no known drinking water guideline exists for this parameter.

Benzo(k) Fluoranthene was detected in the August and October samples from the Strange Street Reservoir at 1.0 ng/L. At present no known drinking water guideline exist for this parameter.

Typically, concentrations of specific PAHs in groundwaters have been found to be 10-50 ng/L. Contact with coal tar based pipe and reservoir coatings may lead to increases in PAH concentrations in the water; and in such cases an increase in the level of fluoranthene is particularly marked.

#### **Volatiles**

The results of the Volatiles scan showed that ten parameters, other than Trihalomethanes (THMs), were detected:

Benzene

Toluene

Ethylbenzene

Para and Meta-Xylene  
1,4 Dichlorobenzene  
1,1 Dichloroethylene  
1,1 Dichloroethane  
1,1,1 Trichloroethane  
Trichloroethylene  
Tetrachloroethylene

Benzene was detected at trace levels, once in the raw and treated K70 water.

Toluene was detected at a trace level, once in the treated K70 water. A total of five positive results were detected in the K70 and K21 water. The other four results from K70 and K21 were due to contamination as indicated by the remark code 'UCS'.

Ethylbenzene was detected at trace levels, three times in the raw and treated K70 water, twice in the K21 raw water and three times in the treated Mannheim Reservoir.

Para and Meta-Xylene are measured as one compound, M-Xylene and were detected at a trace level, once in the raw and treated K70 water.

These volatiles are typically found on an occasional basis at other water supplies included on the DWSP usually at trace levels.

1,4 Dichlorobenzene was detected at a trace level, once in the K21 raw water.

1,1 Dichloroethylene was detected at trace levels, three times in the water from the Strange Street Reservoir.

1,1 Dichloroethane was detected at a trace level, once in the Strange Street Reservoir water.

1,1,1 Trichloroethane was detected at positive levels, eight times in the Strange Street Reservoir water. All positive values were below the EPA Maximum Contaminant Level for Drinking Water of 200.0 ug/L.

Trichloroethylene was detected at trace levels, five times in the Strange Street Reservoir water.

Tetrachloroethylene was detected at trace levels, once in the Strange Street Reservoir water.

THMs are formed from reactions between chlorine and naturally occurring organic compounds. Chloroform and other THMs (chlorodibromomethane, dichlorobromomethane and occasionally bromoform) have been found in water supplies drawn from groundwater sources.

Chloroform, Chlorodibromomethane, Dichlorobromomethane and Total THMs were detected in the treated water samples from all

locations. Bromoform was detected at trace levels, six times in the treated Mannheim Reservoir and four times in the Strange Street Reservoir.

While all occurrences were well below the ODWO of 350 ug/L, the K70 recharge well supply produced higher levels of THMs than either of the other two supplies. This could be due to a higher level of naturally occurring organic matter reflecting the river water origin of the recharge water.

#### CONCLUSIONS

The Kitchener Well Supply for the sample year of 1987 produced good quality water at all locations.

The repeated finding of quantifiable levels of 1,1,1-Trichloroethane and traces of Trichloroethylene in the Strange Street Reservoir indicates contamination of the reservoir or one or more of the source wells.

No health related guidelines, for organic or inorganic parameters, were exceeded during 1987.

#### RECOMMENDATIONS

Two recommendations can be made:

- 1) The data base should be reviewed in consultation with

Regional, Plant and DWSP personnel to determine if sampling location, sampling frequency and the number of parameters analysed could be revised to allow for a more efficient characterization of the water.

2) The source of contamination at the Strange Street Reservoir should be investigated.



TABLE 3

DRINKING WATER SURVEILLANCE PROGRAM K 70 RECHARGE WELL, KITCHENER

SAMPLE DAY CONDITIONSTREATMENT CHEMICAL DOSAGES (MG/L)

## PRE-CHLORINATION

## SODIUM HYPOCHLORITE \*

| DATE   | RETENTION<br>TIME(HRS) | FLOW<br>(1000 M3) |     |
|--------|------------------------|-------------------|-----|
| APR 22 | .3                     | 2.8               | .54 |
| MAY 20 | .5                     | 3.0               | .58 |
| JUN 23 | .5                     | 3.3               | .66 |
| JUL 21 | .5                     | 3.0               | .54 |
| AUG 18 | .3                     | 3.0               | .75 |
| SEP 22 | .5                     | 3.0               | .49 |
| OCT 21 | .5                     | 3.0               | .54 |
| NOV 24 | .6                     | 3.0               | .63 |
| DEC 10 | .3                     | 3.0               | .54 |

\* Dosages of sodium hypochlorite/sodium chlorite unavailable

TABLE 3

DRINKING WATER SURVEILLANCE PROGRAM KITCHENER WELL SUPPLY K21, MANNHEIM

## SAMPLE DAY CONDITIONS

## TREATMENT CHEMICAL DOSAGES (MG/L)

## PRE-CHLORINATION

## SODIUM HYPOCHLORITE

| DATE   | RETENTION<br>TIME(HRS) | FLOW<br>(1000 M3) |
|--------|------------------------|-------------------|
| MAR 23 | .5                     | 21.9              |
| APR 22 | .3                     | 37.4              |
| MAY 20 | .0                     | 29.4              |
| JUN 23 | .5                     | 29.5              |
| JUL 21 | .5                     | 37.0              |
| AUG 18 | .4                     | 34.5              |
| SEP 22 | .5                     | 38.0              |
| OCT 21 | .5                     | 43.9              |
| NOV 24 | .6                     | 45.4              |
| DEC 10 | .6                     | 47.8              |

1.05

1.07

1.12

.99

1.06

1.06

1.02

1.06

1.01

1.16

TABLE 4

## DRINKING WATER SURVEILLANCE PROGRAM K 70 RECHARGE WELL, KITCHENER

## SUMMARY TABLE OF RESULTS (1987)

| SCAN                              | PARAMETER | RAW   |          |       | TREATED |          |       |
|-----------------------------------|-----------|-------|----------|-------|---------|----------|-------|
|                                   |           | TOTAL | POSITIVE | TRACE | TOTAL   | POSITIVE | TRACE |
| BACTERIOLOGICAL                   |           | 39    | 14       | 0     | 43      | 9        | 0     |
| *TOTAL SCAN BACTERIOLOGICAL       |           | 39    | 14       | 0     | 43      | 9        | 0     |
| *TOTAL GROUP BACTERIOLOGICAL      |           | 39    | 14       | 0     | 43      | 9        | 0     |
| CHEMISTRY (FLD)                   |           | 20    | 20       | 0     | 49      | 49       | 0     |
| *TOTAL SCAN CHEMISTRY (FLD)       |           | 20    | 20       | 0     | 49      | 49       | 0     |
| CHEMISTRY (LAB)                   |           | 189   | 146      | 24    | 189     | 151      | 21    |
| *TOTAL SCAN CHEMISTRY (LAB)       |           | 189   | 146      | 24    | 189     | 151      | 21    |
| METALS                            |           | 201   | 87       | 7     | 201     | 88       | 6     |
| *TOTAL SCAN METALS                |           | 201   | 87       | 7     | 201     | 88       | 6     |
| *TOTAL GROUP INORGANIC & PHYSICAL |           | 410   | 253      | 31    | 439     | 288      | 27    |
| CHLOROAROMATICS                   |           | 130   | 0        | 1     | 130     | 0        | 0     |
| *TOTAL SCAN CHLOROAROMATICS       |           | 130   | 0        | 1     | 130     | 0        | 0     |

TABLE 4

DRINKING WATER SURVEILLANCE PROGRAM K 70 RECHARGE WELL, KITCHENER

## SUMMARY TABLE OF RESULTS (1987)

| SCAN                            | PARAMETER | RAW   |          |       | TREATED |          |       |
|---------------------------------|-----------|-------|----------|-------|---------|----------|-------|
|                                 |           | TOTAL | POSITIVE | TRACE | TOTAL   | POSITIVE | TRACE |
| CHLOROPHENOLS                   |           | 12    | 0        | 0     | 12      | 0        | 0     |
| *TOTAL SCAN CHLOROPHENOLS       |           | 12    | 0        | 0     | 12      | 0        | 0     |
| PAH                             |           | 34    | 0        | 0     | 34      | 0        | 0     |
| *TOTAL SCAN PAH                 |           | 34    | 0        | 0     | 34      | 0        | 0     |
| PESTICIDES & PCB                |           | 247   | 0        | 0     | 247     | 0        | 0     |
| *TOTAL SCAN PESTICIDES & PCB    |           | 247   | 0        | 0     | 247     | 0        | 0     |
| PHENOLICS                       |           | 10    | 1        | 2     | 10      | 1        | 2     |
| *TOTAL SCAN PHENOLICS           |           | 10    | 1        | 2     | 10      | 1        | 2     |
| SPECIFIC PESTICIDES             |           | 134   | 0        | 3     | 134     | 0        | 4     |
| *TOTAL SCAN SPECIFIC PESTICIDES |           | 134   | 0        | 3     | 134     | 0        | 4     |
| VOLATILES                       |           | 279   | 3        | 5     | 280     | 32       | 10    |

TABLE 4

DRINKING WATER SURVEILLANCE PROGRAM K 70 RECHARGE WELL, KITCHENER

## SUMMARY TABLE OF RESULTS (1987)

| SCAN                  | PARAMETER | RAW   |          |       | TREATED |          |       |
|-----------------------|-----------|-------|----------|-------|---------|----------|-------|
|                       |           | TOTAL | POSITIVE | TRACE | TOTAL   | POSITIVE | TRACE |
| *TOTAL SCAN VOLATILES |           | 279   | 3        | 5     | 280     | 32       | 10    |
| *TOTAL GROUP ORGANIC  |           | 846   | 4        | 11    | 847     | 33       | 16    |
|                       |           |       |          |       |         |          |       |
| TOTAL                 |           | 1295  | 271      | 42    | 1329    | 330      | 43    |

TABLE 4

DRINKING WATER SURVEILLANCE PROGRAM KITCHENER WELL SUPPLY K21, MANNHEIM RES

## SUMMARY TABLE OF RESULTS (1987)

| SCAN                              | PARAMETER | RAW   |          |       | TREATED |          |       |
|-----------------------------------|-----------|-------|----------|-------|---------|----------|-------|
|                                   |           | TOTAL | POSITIVE | TRACE | TOTAL   | POSITIVE | TRACE |
| BACTERIOLOGICAL                   |           | 43    | 14       | 0     | 47      | 13       | 0     |
| *TOTAL SCAN BACTERIOLOGICAL       |           | 43    | 14       | 0     | 47      | 13       | 0     |
| *TOTAL GROUP BACTERIOLOGICAL      |           | 43    | 14       | 0     | 47      | 13       | 0     |
| CHEMISTRY (FLD)                   |           | 22    | 22       | 0     | 35      | 35       | 0     |
| *TOTAL SCAN CHEMISTRY (FLD)       |           | 22    | 22       | 0     | 35      | 35       | 0     |
| CHEMISTRY (LAB)                   |           | 208   | 142      | 37    | 188     | 123      | 43    |
| *TOTAL SCAN CHEMISTRY (LAB)       |           | 208   | 142      | 37    | 188     | 123      | 43    |
| METALS                            |           | 221   | 109      | 6     | 221     | 103      | 7     |
| *TOTAL SCAN METALS                |           | 221   | 109      | 6     | 221     | 103      | 7     |
| *TOTAL GROUP INORGANIC & PHYSICAL |           | 451   | 273      | 43    | 444     | 261      | 50    |
| CHLOROAROMATICS                   |           | 130   | 0        | 0     | 143     | 0        | 2     |
| *TOTAL SCAN CHLOROAROMATICS       |           | 130   | 0        | 0     | 143     | 0        | 2     |

TABLE 4

DRINKING WATER SURVEILLANCE PROGRAM KITCHENER WELL SUPPLY K21, MANNHEIM RES

## SUMMARY TABLE OF RESULTS (1987)

| SCAN                            | PARAMETER | RAW   |          |       | TREATED |          |       |
|---------------------------------|-----------|-------|----------|-------|---------|----------|-------|
|                                 |           | TOTAL | POSITIVE | TRACE | TOTAL   | POSITIVE | TRACE |
| CHLOROPHENOLS                   |           | 6     | 0        | 0     | 12      | 0        | 0     |
| *TOTAL SCAN CHLOROPHENOLS       |           | 6     | 0        | 0     | 12      | 0        | 0     |
| PAH                             |           | 51    | 0        | 0     | 51      | 0        | 0     |
| *TOTAL SCAN PAH                 |           | 51    | 0        | 0     | 51      | 0        | 0     |
| PESTICIDES & PCB                |           | 250   | 0        | 0     | 272     | 0        | 2     |
| *TOTAL SCAN PESTICIDES & PCB    |           | 250   | 0        | 0     | 272     | 0        | 2     |
| PHENOLICS                       |           | 11    | 1        | 4     | 9       | 1        | 1     |
| *TOTAL SCAN PHENOLICS           |           | 11    | 1        | 4     | 9       | 1        | 1     |
| SPECIFIC PESTICIDES             |           | 138   | 0        | 3     | 144     | 0        | 0     |
| *TOTAL SCAN SPECIFIC PESTICIDES |           | 138   | 0        | 3     | 144     | 0        | 0     |
| VOLATILES                       |           | 307   | 1        | 3     | 308     | 16       | 23    |

TABLE 4

DRINKING WATER SURVEILLANCE PROGRAM KITCHENER WELL SUPPLY K21, MANNHEIM RES

## SUMMARY TABLE OF RESULTS (1987)

| SCAN                  | PARAMETER | RAW   |          |       | TREATED |          |       |
|-----------------------|-----------|-------|----------|-------|---------|----------|-------|
|                       |           | TOTAL | POSITIVE | TRACE | TOTAL   | POSITIVE | TRACE |
| *TOTAL SCAN VOLATILES |           | 307   | 1        | 3     | 308     | 16       | 23    |
| *TOTAL GROUP ORGANIC  |           | 893   | 2        | 10    | 939     | 17       | 28    |
| -----                 |           |       |          |       |         |          |       |
| TOTAL                 |           | 1387  | 289      | 53    | 1430    | 291      | 78    |



TABLE 4

## DRINKING WATER SURVEILLANCE PROGRAM STRANGE STREET RESERVOIR, KITCHENER

## SUMMARY TABLE OF RESULTS (1987)

| SCAN                              | PARAMETER | TREATED |          |       |
|-----------------------------------|-----------|---------|----------|-------|
|                                   |           | TOTAL   | POSITIVE | TRACE |
| BACTERIOLOGICAL                   |           | 30      | 6        | 0     |
| *TOTAL SCAN BACTERIOLOGICAL       |           | 30      | 6        | 0     |
| *TOTAL GROUP BACTERIOLOGICAL      |           | 30      | 6        | 0     |
| CHEMISTRY (FLD)                   |           | 29      | 29       | 0     |
| *TOTAL SCAN CHEMISTRY (FLD)       |           | 29      | 29       | 0     |
| CHEMISTRY (LAB)                   |           | 150     | 104      | 30    |
| *TOTAL SCAN CHEMISTRY (LAB)       |           | 150     | 104      | 30    |
| METALS                            |           | 162     | 78       | 3     |
| *TOTAL SCAN METALS                |           | 162     | 78       | 3     |
| *TOTAL GROUP INORGANIC & PHYSICAL |           | 341     | 211      | 33    |
| CHLOROAROMATICS                   |           | 104     | 0        | 1     |
| *TOTAL SCAN CHLOROAROMATICS       |           | 104     | 0        | 1     |

TABLE 4

DRINKING WATER SURVEILLANCE PROGRAM STRANGE STREET RESERVOIR, KITCHENER

## SUMMARY TABLE OF RESULTS (1987)

| SCAN                            | PARAMETER | TREATED |          |       |
|---------------------------------|-----------|---------|----------|-------|
|                                 |           | TOTAL   | POSITIVE | TRACE |
| CHLOROPHENOLS                   |           | 6       | 0        | 0     |
| *TOTAL SCAN CHLOROPHENOLS       |           | 6       | 0        | 0     |
| PAH                             |           | 34      | 6        | 0     |
| *TOTAL SCAN PAH                 |           | 34      | 6        | 0     |
| PESTICIDES & PCB                |           | 198     | 0        | 0     |
| *TOTAL SCAN PESTICIDES & PCB    |           | 198     | 0        | 0     |
| PHENOLICS                       |           | 8       | 1        | 0     |
| *TOTAL SCAN PHENOLICS           |           | 8       | 1        | 0     |
| SPECIFIC PESTICIDES             |           | 99      | 0        | 0     |
| *TOTAL SCAN SPECIFIC PESTICIDES |           | 99      | 0        | 0     |
| VOLATILES                       |           | 225     | 32       | 24    |

TABLE 4

DRINKING WATER SURVEILLANCE PROGRAM STRANGE STREET RESERVOIR, KITCHENER

## SUMMARY TABLE OF RESULTS (1987)

| SCAN                  | PARAMETER | TREATED |          |       |
|-----------------------|-----------|---------|----------|-------|
|                       |           | TOTAL   | POSITIVE | TRACE |
| *TOTAL SCAN VOLATILES |           | 225     | 32       | 24    |
| *TOTAL GROUP ORGANIC  |           | 674     | 39       | 25    |
| -----                 |           |         |          |       |
| TOTAL                 |           | 1045    | 256      | 58    |

## KEY TO TABLES 5 AND 6

- A      ONTARIO DRINKING WATER OBJECTIVES
1. Maximum Acceptable Concentration (MAC)
  - 1+. MAC for Total Trihalomethanes
  - 1\*. MAC for Bacteriological Analyses
- Poor water quality is indicated when :
- total coliform counts  $> 0 < 5$
  - P/A Bottle Test is present after 48 hours
  - Aeromonas organisms are detected in more than 25% of samples in a single submission or in successive submissions from the same sampling site
  - Pseudomonas Aeruginosa, Staphylococcus Aureus and members of the Fecal Streptococcus group should not be detected in any sample
  - Standard Plate Count should not exceed 500 organisms per ml at 35 deg C within 48 hours
2. Interim Maximum Acceptable Concentration (IMAC)
  3. Maximum Desirable Concentration (MDC)
  4. Aesthetic or Recommended Operational Guideline
- hardness levels between 80 and 100 mg/L as calcium carbonate are considered to provide an acceptable balance between corrosion and incrustation, water supplies with a hardness  $> 200$  mg/L are considered poor and those in excess of 500 mg/L are unacceptable.
- B      HEALTH & WELFARE CANADA
1. Maximum Acceptable Concentration (MAC)
  2. Proposed MAC
  3. Interim MAC
- C      WORLD HEALTH ORGANIZATION
1. Guideline Value (GV)
  2. Tentative GV
  3. Aesthetic GV
- D      US ENVIRONMENTAL PROTECTION AGENCY (EPA)
1. Maximum Contaminant Level (MCL)
  2. Suggested No-Adverse Effect Level (SNAEL)
  3. Lifetime Health Advisory
  4. EPA Ambient Water Quality Criteria
- F      EUROPEAN ECONOMIC COMMUNITY (EEC)
1. Health Related Guideline Level
  2. Aesthetic Guideline Level
  3. Maximum Admissible Concentration (MADC)
- G      CALIFORNIA STATE DEPARTMENT OF HEALTH-GUIDELINE VALUE
- H      USSR MAXIMUM PERMISSIBLE CONCENTRATION
- I      NEW YORK STATE AMBIENT WATER GUIDELINE

LABORATORY RESULTS, REMARK DESCRIPTIONS

|     |  |
|-----|--|
| .   | No Sample Taken                                    |
| BDL | Below Minimum Measurable Amount                    |
| <T  | Greater Than Detection Limit But Not Confident     |
| >   | Results Are Greater Than The Upper Limit           |
| <=> | Approximate Result                                 |
| !AW | No Data: Analysis Withdrawn                        |
| !CR | No Data: Could Not Confirm By Reanalysis           |
| !CS | No Data: Contamination Suspected                   |
| !IL | No Data: Sample Incorrectly Labelled               |
| !IS | No Data: Insufficient Sample                       |
| !LA | No Data: Laboratory Accident                       |
| !LD | No Data: Test Queued After Sample Discarded        |
| !NA | No Data: No Authorization To Perform Reanalysis    |
| !NP | No Data: No Procedure                              |
| !NR | No Data: Sample Not Received                       |
| !OP | No Data: Obscured Plate                            |
| !PE | No Data: Procedural Error - Sample Discarded       |
| !PH | No Data: Sample pH Outside Valid Range             |
| !RO | No Data: See Attached Report (no numeric results)  |
| !SM | No Data: Sample Missing                            |
| !SS | No Data: Send Separate Sample Properly Preserved   |
| !UI | No Data: Indeterminant Interference                |
| A3C | Approximate, Total Count Exceeded 300 Colonies     |
| APL | Additional Peak, Large, Not Priority Pollutant     |
| APS | Additional Peak, Less Than, Not Priority Pollutant |
| CIC | Possible Contamination, Improper Cap               |
| CRO | Calculated Result Only                             |
| PPS | Test Performed On Preserved Sample                 |

|     |  |
|-----|--|
| RMP | P and M-Xylene Not Separated                 |
| RRV | Rerun Verification                           |
| RVU | Reported Value Unusual                       |
| SPS | Several Peaks, Small, Not Priority Pollutant |
| UAL | Unreliable: Sample Age Exceeds Normal Limit  |
| UCR | Unreliable: Could Not Confirm By Reanalysis  |
| UCS | Unreliable: Contamination Suspected          |
| UIN | Unreliable: Indeterminant Interference       |
| XP  | Positive After X Number of Hours             |

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM K 70 RECHARGE WELL, KITCHENER 1987

| WATER TREATMENT PLANT         |     | DISTRIBUTION SYSTEM |                         |
|-------------------------------|-----|---------------------|-------------------------|
|                               | RAW | TREATED             |                         |
| -----                         |     |                     |                         |
| BACTERIOLOGICAL               |     |                     |                         |
| AEROMONAS SP (0=ABSENT )      |     | DET'N LIMIT = N/A   | GUIDELINE = 0 (A1)      |
| MAR                           | .   | 0                   |                         |
| -----                         |     |                     |                         |
| E. COLI (P/A) (0=ABSENT )     |     | DET'N LIMIT = N/A   | GUIDELINE =             |
| MAR                           | .   | 0                   |                         |
| -----                         |     |                     |                         |
| FECAL COLIFORM MF (CT/100ML ) |     | DET'N LIMIT = 0     | GUIDELINE = 0 (A1)      |
| MAR                           | 0   | .                   |                         |
| APR                           | 0   | .                   |                         |
| MAY                           | 0   | .                   |                         |
| JUN                           | 0   | .                   |                         |
| JUL                           | 0   | .                   |                         |
| AUG                           | 0   | .                   |                         |
| SEP                           | 0   | .                   |                         |
| OCT                           | 0   | .                   |                         |
| NOV                           | 7   | .                   |                         |
| DEC                           | 4   | .                   |                         |
| -----                         |     |                     |                         |
| FECAL COLIFORM (0=ABSENT )    |     | DET'N LIMIT = N/A   | GUIDELINE = 0 (A1)      |
| MAR                           | .   | 0                   |                         |
| -----                         |     |                     |                         |
| STANDRD PLATE CNT MF (CT/ML ) |     | DET'N LIMIT = 0     | GUIDELINE = 500/ML (A1) |
| MAR                           | 0   | 0                   |                         |
| APR                           | 0   | 0                   |                         |
| MAY                           | 29  | !LA                 |                         |
| JUN                           | 2   | 4                   |                         |
| JUL                           | 1   | 3                   |                         |
| AUG                           | 3   | 10                  |                         |
| SEP                           | 1   | 3                   |                         |
| OCT                           | 1   | 2                   |                         |
| NOV                           | 0   | 1                   |                         |
| DEC                           | !AW | !AW                 |                         |
| -----                         |     |                     |                         |
| P/A BOTTLE (0=ABSENT )        |     | DET'N LIMIT = 0     | GUIDELINE = 0 (A1*)     |
| MAR                           | .   | 1                   |                         |
| APR                           | .   | 0                   |                         |
| MAY                           | .   | 0                   |                         |
| JUN                           | .   | 0                   |                         |
| JUL                           | .   | 0                   |                         |
| AUG                           | .   | 0                   |                         |
| SEP                           | .   | 0                   |                         |

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM K 70 RECHARGE WELL, KITCHENER 1987

| WATER TREATMENT PLANT            |     |                   | DISTRIBUTION SYSTEM     |      |
|----------------------------------|-----|-------------------|-------------------------|------|
|                                  | RAW | TREATED           |                         |      |
| -----                            |     |                   |                         |      |
| OCT                              | .   | 0                 |                         |      |
| NOV                              | .   | 0                 |                         |      |
| DEC                              | .   | 0                 |                         |      |
| -----                            |     |                   |                         |      |
| STAPH AUREUS (0=ABSENT )         |     | DET'N LIMIT = N/A | GUIDELINE = 0           | (A1) |
| MAR                              | .   | 0                 |                         |      |
| -----                            |     |                   |                         |      |
| COLIFORM (0=ABSENT )             |     | DET'N LIMIT = N/A | GUIDELINE = 0           | (A1) |
| MAR                              | .   | 0                 |                         |      |
| -----                            |     |                   |                         |      |
| TOTAL COLIFORM MF (CT/100ML )    |     | DET'N LIMIT = 0   | GUIDELINE = 5/100ML(A1) |      |
| MAR                              | 0   | 0                 |                         |      |
| APR                              | 0   | 0                 |                         |      |
| MAY                              | 0   | 0                 |                         |      |
| JUN                              | BDL | 0                 |                         |      |
| JUL                              | 0   | 0                 |                         |      |
| AUG                              | BDL | 0                 |                         |      |
| SEP                              | 0   | 0                 |                         |      |
| OCT                              | 0   | 0                 |                         |      |
| NOV                              | 8   | 0                 |                         |      |
| DEC                              | 4   | 0                 |                         |      |
| -----                            |     |                   |                         |      |
| T COLIFORM BCKGRD MF (CT/100ML ) |     | DET'N LIMIT = 0   | GUIDELINE = N/A         |      |
| MAR                              | 0   | 0                 |                         |      |
| APR                              | 0   | 0                 |                         |      |
| MAY                              | 4   | 1                 |                         |      |
| JUN                              | BDL | 0                 |                         |      |
| JUL                              | 0   | 1                 |                         |      |
| AUG                              | 2   | 0                 |                         |      |
| SEP                              | 0   | 0                 |                         |      |
| OCT                              | 0   | 0                 |                         |      |
| NOV                              | 300 | 0                 |                         |      |
| DEC                              | 35  | 0                 |                         |      |



TABLE 5

## DRINKING WATER SURVEILLANCE PROGRAM K 70 RECHARGE WELL, KITCHENER 1987

| WATER TREATMENT PLANT       |         | DISTRIBUTION SYSTEM |                          |
|-----------------------------|---------|---------------------|--------------------------|
| RAW                         | TREATED |                     |                          |
| -----                       |         |                     |                          |
| CHEMISTRY (FLD)             |         |                     |                          |
| FLD CHLORINE (COMB) (MG/L ) |         | DET'N LIMIT = N/A   | GUIDELINE = N/A          |
| MAR                         | .100    |                     |                          |
| MAY                         | .100    |                     |                          |
| JUN                         | .100    |                     |                          |
| JUL                         | .100    |                     |                          |
| AUG                         | .200    |                     |                          |
| SEP                         | .200    |                     |                          |
| OCT                         | .300    |                     |                          |
| NOV                         | .200    |                     |                          |
| DEC                         | .200    |                     |                          |
| -----                       |         |                     |                          |
| FLD CHLORINE FREE (MG/L )   |         | DET'N LIMIT = N/A   | GUIDELINE = N/A          |
| MAR                         | .500    |                     |                          |
| APR                         | .500    |                     |                          |
| MAY                         | .400    |                     |                          |
| JUN                         | .400    |                     |                          |
| JUL                         | .300    |                     |                          |
| AUG                         | .100    |                     |                          |
| SEP                         | .100    |                     |                          |
| OCT                         | .200    |                     |                          |
| NOV                         | .100    |                     |                          |
| DEC                         | .100    |                     |                          |
| -----                       |         |                     |                          |
| TOTAL CHLORINE (MG/L )      |         | DET'N LIMIT = N/A   | GUIDELINE = N/A          |
| MAR                         | .600    |                     |                          |
| APR                         | .500    |                     |                          |
| MAY                         | .500    |                     |                          |
| JUN                         | .500    |                     |                          |
| JUL                         | .400    |                     |                          |
| AUG                         | .300    |                     |                          |
| SEP                         | .300    |                     |                          |
| OCT                         | .500    |                     |                          |
| NOV                         | .300    |                     |                          |
| DEC                         | .300    |                     |                          |
| -----                       |         |                     |                          |
| FLD PH (DMSNLESS )          |         | DET'N LIMIT = N/A   | GUIDELINE = 6.5-8.5 (A4) |
| MAR                         | 7.500   | 7.500               |                          |
| APR                         | 7.500   | 7.500               |                          |
| MAY                         | 7.500   | 7.500               |                          |
| JUN                         | 7.500   | 7.500               |                          |
| JUL                         | 7.500   | 7.500               |                          |
| AUG                         | 7.500   | 7.500               |                          |
| SEP                         | 7.500   | 7.500               |                          |

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM K 70 RECHARGE WELL, KITCHENER 1987

| WATER TREATMENT PLANT |                   |         | DISTRIBUTION SYSTEM |     |
|-----------------------|-------------------|---------|---------------------|-----|
|                       | RAW               | TREATED |                     |     |
| -----                 |                   |         |                     |     |
| OCT                   | 7.500             | 7.500   |                     |     |
| NOV                   | 7.500             | 7.500   |                     |     |
| DEC                   | 7.300             | 7.300   |                     |     |
| -----                 |                   |         |                     |     |
| TEMPERATURE (DEG.C )  | DET'N LIMIT = N/A |         | GUIDELINE =         | N/A |
| MAR                   | 8.500             | 7.500   |                     |     |
| APR                   | 6.500             | 7.000   |                     |     |
| MAY                   | 8.000             | 9.500   |                     |     |
| JUN                   | 13.000            | 13.000  |                     |     |
| JUL                   | 16.000            | 17.000  |                     |     |
| AUG                   | 17.000            | 18.000  |                     |     |
| SEP                   | 16.000            | 17.000  |                     |     |
| OCT                   | 15.000            | 15.000  |                     |     |
| NOV                   | 13.000            | 12.000  |                     |     |
| DEC                   | 11.000            | 10.000  |                     |     |

TABLE 5

## DRINKING WATER SURVEILLANCE PROGRAM K 70 RECHARGE WELL, KITCHENER 1987

| WATER TREATMENT PLANT |         |                    | DISTRIBUTION SYSTEM |                         |
|-----------------------|---------|--------------------|---------------------|-------------------------|
| RAW                   |         | TREATED            |                     |                         |
| -----                 |         |                    |                     |                         |
| CHEMISTRY (LAB)       |         |                    |                     |                         |
| ALKALINITY (MG/L )    |         | DET'N LIMIT = .200 |                     | GUIDELINE = 30-500 (A4) |
| MAR                   | 267.700 | 268.300            |                     |                         |
| APR                   | 245.400 | 245.300            |                     |                         |
| MAY                   | 230.600 | 233.900            |                     |                         |
| JUN                   | 227.400 | 227.500            |                     |                         |
| JUL                   | 223.100 | 224.600            |                     |                         |
| AUG                   | 223.300 | 224.700            |                     |                         |
| SEP                   | 212.600 | 213.000            |                     |                         |
| OCT                   | 215.500 | 215.700            |                     |                         |
| NOV                   | 226.500 | 226.500            |                     |                         |
| DEC                   | 219.700 | 225.900            |                     |                         |
| -----                 |         |                    |                     |                         |
| CALCIUM (MG/L )       |         | DET'N LIMIT = .100 |                     | GUIDELINE = 100. (F2)   |
| MAR                   | 87.500  | 87.400             |                     |                         |
| APR                   | 81.200  | 79.900             |                     |                         |
| MAY                   | 80.000  | 80.000             |                     |                         |
| JUN                   | 72.600  | 72.200             |                     |                         |
| JUL                   | 72.400  | 72.000             |                     |                         |
| AUG                   | 70.000  | 71.400             |                     |                         |
| SEP                   | 69.600  | 68.800             |                     |                         |
| OCT                   | 70.000  | 71.000             |                     |                         |
| NOV                   | 76.400  | 77.000             |                     |                         |
| DEC                   | 77.200  | 81.000             |                     |                         |
| -----                 |         |                    |                     |                         |
| CHLORIDE (MG/L )      |         | DET'N LIMIT = .200 |                     | GUIDELINE = 250.0 (A3)  |
| MAR                   | 35.000  | 35.500             |                     |                         |
| APR                   | 24.500  | 25.500             |                     |                         |
| MAY                   | 30.000  | 30.500             |                     |                         |
| JUN                   | 30.000  | 30.500             |                     |                         |
| JUL                   | 30.000  | 30.500             |                     |                         |
| AUG                   | 29.500  | 30.000             |                     |                         |
| SEP                   | 30.500  | 31.000             |                     |                         |
| OCT                   | 32.400  | 32.700             |                     |                         |
| NOV                   | 35.200  | 35.000             |                     |                         |
| DEC                   | 33.500  | 32.300             |                     |                         |
| -----                 |         |                    |                     |                         |
| COLOUR (TCU )         |         | DET'N LIMIT = .5   |                     | GUIDELINE = 5.0 (A3)    |
| MAR                   | 5.000   | 4.000              |                     |                         |
| APR                   | 5.000   | 3.500              |                     |                         |
| MAY                   | 4.500   | 3.500              |                     |                         |
| JUN                   | 4.500   | 4.000              |                     |                         |
| JUL                   | 6.000   | 5.000              |                     |                         |
| AUG                   | 6.000   | 6.000              |                     |                         |

TABLE 5

## DRINKING WATER SURVEILLANCE PROGRAM K 70 RECHARGE WELL, KITCHENER 1987

| WATER TREATMENT PLANT   |                    | DISTRIBUTION SYSTEM |                         |
|-------------------------|--------------------|---------------------|-------------------------|
|                         | RAW                | TREATED             |                         |
| <hr/>                   |                    |                     |                         |
| SEP                     | 5.000              | 4.500               |                         |
| OCT                     | 4.500              | 4.000               |                         |
| NOV                     | 4.000              | 3.000               |                         |
| DEC                     | .500 <T            | .500 <T             |                         |
| <hr/>                   |                    |                     |                         |
| CONDUCTIVITY (UMHO/CM ) | DET'N LIMIT = 1    |                     | GUIDELINE = 400. (F2)   |
| MAR                     | 653                | 657                 |                         |
| APR                     | 618                | 622                 |                         |
| MAY                     | 616                | 619                 |                         |
| JUN                     | 586                | 589                 |                         |
| JUL                     | 577                | 581                 |                         |
| AUG                     | 567                | 573                 |                         |
| SEP                     | 543                | 544                 |                         |
| OCT                     | 573                | 576                 |                         |
| NOV                     | 616                | 617                 |                         |
| DEC                     | 597                | 611                 |                         |
| <hr/>                   |                    |                     |                         |
| FLUORIDE (MG/L )        | DET'N LIMIT = .01  |                     | GUIDELINE = 2.400 (A1)  |
| MAR                     | .130               | .130                |                         |
| APR                     | .140               | .140                |                         |
| MAY                     | .120               | .120                |                         |
| JUN                     | .160               | .120                |                         |
| JUL                     | .200               | .160                |                         |
| AUG                     | .150               | .160                |                         |
| SEP                     | .140               | .140                |                         |
| OCT                     | .140               | .140                |                         |
| NOV                     | .140               | .120                |                         |
| DEC                     | .140               | .120                |                         |
| <hr/>                   |                    |                     |                         |
| HARDNESS (MG/L )        | DET'N LIMIT = .500 |                     | GUIDELINE = 80-100 (A4) |
| MAR                     | 324.500            | 324.000             |                         |
| APR                     | 296.000            | 292.000             |                         |
| MAY                     | 290.000            | 290.000             |                         |
| JUN                     | 270.000            | 269.000             |                         |
| JUL                     | 269.000            | 266.000             |                         |
| AUG                     | 257.000            | 262.000             |                         |
| SEP                     | 261.000            | 258.000             |                         |
| OCT                     | 264.000            | 266.000             |                         |
| NOV                     | 284.000            | 289.000             |                         |
| DEC                     | 290.000            | 300.000             |                         |
| <hr/>                   |                    |                     |                         |
| MAGNESIUM (MG/L )       | DET'N LIMIT = .050 |                     | GUIDELINE = 30. (F2)    |
| MAR                     | 25.700             | 25.700              |                         |

TABLE 5

## DRINKING WATER SURVEILLANCE PROGRAM K 70 RECHARGE WELL, KITCHENER 1987

| WATER TREATMENT PLANT  |                        | DISTRIBUTION SYSTEM |
|------------------------|------------------------|---------------------|
|                        | RAW                    | TREATED             |
| <hr/>                  |                        |                     |
| APR                    | 22.600                 | 22.500              |
| MAY                    | 21.800                 | 21.900              |
| JUN                    | 21.600                 | 21.500              |
| JUL                    | 21.200                 | 20.900              |
| AUG                    | 20.000                 | 20.200              |
| SEP                    | 21.200                 | 21.000              |
| OCT                    | 21.700                 | 21.500              |
| NOV                    | 22.600                 | 23.400              |
| DEC                    | 23.600                 | 23.700              |
| <hr/>                  |                        |                     |
| SODIUM (MG/L )         | DET'N LIMIT = .200     |                     |
|                        | GUIDELINE = 200. (C3)  |                     |
| MAR                    | 20.100                 | 20.800              |
| APR                    | 14.500                 | 14.600              |
| MAY                    | 18.800                 | 19.200              |
| JUN                    | 19.600                 | 20.400              |
| JUL                    | 19.400                 | 19.800              |
| AUG                    | 18.200                 | 18.400              |
| SEP                    | 19.800                 | 20.000              |
| OCT                    | 20.400                 | 20.800              |
| NOV                    | 21.400                 | 21.400              |
| DEC                    | 20.600                 | 20.800              |
| <hr/>                  |                        |                     |
| AMMONIUM TOTAL (MG/L ) | DET'N LIMIT = 0.002    |                     |
|                        | GUIDELINE = .05 (F2)   |                     |
| MAR                    | BDL                    | BDL                 |
| APR                    | BDL                    | .002 <T             |
| MAY                    | BDL                    | BDL                 |
| JUN                    | .012                   | .012                |
| JUL                    | .018                   | .022                |
| AUG                    | BDL                    | .032                |
| SEP                    | .036                   | .036                |
| OCT                    | .008 <T                | .020                |
| NOV                    | .018                   | .018                |
| DEC                    | BDL                    | BDL                 |
| <hr/>                  |                        |                     |
| NITRITE (MG/L )        | DET'N LIMIT = 0.001    |                     |
|                        | GUIDELINE = 1.000 (A1) |                     |
| MAR                    | .001 <T                | .001 <T             |
| APR                    | BDL                    | BDL                 |
| MAY                    | BDL                    | BDL                 |
| JUN                    | .005                   | .004 <T             |
| JUL                    | .003 <T                | .001 <T             |
| AUG                    | .060                   | .019                |
| SEP                    | .007                   | .003 <T             |
| OCT                    | .016                   | BDL                 |
| NOV                    | .008                   | .009                |

TABLE 5

## DRINKING WATER SURVEILLANCE PROGRAM K 70 RECHARGE WELL, KITCHENER 1987

| WATER TREATMENT PLANT        |         | DISTRIBUTION SYSTEM  |                         |
|------------------------------|---------|----------------------|-------------------------|
|                              | RAW     | TREATED              |                         |
| DEC                          | .003 <T | .001 <T              |                         |
| TOTAL NITRATES (MG/L )       |         | DET'N LIMIT = .020   | GUIDELINE = 10.000 (A1) |
| MAR                          | 2.680   | 2.630                |                         |
| APR                          | 3.370   | 3.200                |                         |
| MAY                          | 1.860   | 1.890                |                         |
| JUN                          | .810    | .810                 |                         |
| JUL                          | .610    | .610                 |                         |
| AUG                          | .445    | .415                 |                         |
| SEP                          | .370    | .375                 |                         |
| OCT                          | .775    | .755                 |                         |
| NOV                          | 1.730   | 1.710                |                         |
| DEC                          | 3.610   | 3.600                |                         |
| NITROGEN TOT KJELD (MG/L )   |         | DET'N LIMIT = .020   | GUIDELINE = N/A         |
| MAR                          | .220    | .230                 |                         |
| APR                          | .220    | .210                 |                         |
| MAY                          | .190    | .170                 |                         |
| JUN                          | .190    | .200                 |                         |
| JUL                          | .170    | .210                 |                         |
| AUG                          | .190    | .260                 |                         |
| SEP                          | .200    | .210                 |                         |
| OCT                          | .180    | .220                 |                         |
| NOV                          | .270    | .200                 |                         |
| DEC                          | .280    | .310                 |                         |
| PH (DMSNLESS )               |         | DET'N LIMIT = N/A    | GUIDELINE = 6.5-8.5(A4) |
| MAR                          | 8.020   | 8.060                |                         |
| APR                          | 8.090   | 8.100                |                         |
| MAY                          | 7.900   | 8.230                |                         |
| JUN                          | 8.170   | 8.190                |                         |
| JUL                          | 8.090   | 8.100                |                         |
| AUG                          | 8.060   | 8.070                |                         |
| SEP                          | 8.300   | 8.430                |                         |
| OCT                          | 8.080   | 8.130                |                         |
| NOV                          | 8.250   | 8.270                |                         |
| DEC                          | 8.400   | 8.340                |                         |
| PHOSPHORUS FIL REACT (MG/L ) |         | DET'N LIMIT = .5UG/L | GUIDELINE = N/A         |
| MAR                          | .001 <T | .002                 |                         |
| APR                          | .001 <T | .002 <T              |                         |
| MAY                          | .002 <T | .002                 |                         |
| JUN                          | .001 <T | .002                 |                         |

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM K 70 RECHARGE WELL, KITCHENER 1987

| WATER TREATMENT PLANT        |                    | DISTRIBUTION SYSTEM |                       |
|------------------------------|--------------------|---------------------|-----------------------|
|                              | RAW                | TREATED             |                       |
| <hr/>                        |                    |                     |                       |
| JUL                          | .001 <T            | .002 <T             |                       |
| AUG                          | .002 <T            | .003                |                       |
| SEP                          | .001 <T            | .003                |                       |
| OCT                          | .001 <T            | .002 <T             |                       |
| NOV                          | .003               | .003                |                       |
| DEC                          | BDL                | BDL                 |                       |
| <hr/>                        |                    |                     |                       |
| PHOSPHORUS TTL-UNFIL (MG/L ) | DET'N LIMIT = .002 |                     | GUIDELINE = .40 (F2)  |
| MAR                          | .003 <T            | .005 <T             |                       |
| APR                          | .007 <T            | .011                |                       |
| MAY                          | .004 <T            | .002 <T             |                       |
| JUN                          | .003 <T            | .003 <T             |                       |
| JUL                          | .002 <T            | .003 <T             |                       |
| AUG                          | .003 <T            | .004 <T             |                       |
| SEP                          | .135               | .006 <T             |                       |
| OCT                          | BDL                | .002 <T             |                       |
| NOV                          | .003 <T            | .004 <T             |                       |
| DEC                          | BDL                | BDL                 |                       |
| <hr/>                        |                    |                     |                       |
| RESIDUE (TOTAL) (MG/L )      | DET'N LIMIT = 1.   |                     | GUIDELINE = 500. (A3) |
| MAR                          | 468                | 452                 |                       |
| APR                          | 381                | 378                 |                       |
| MAY                          | 400 CRO            | 402 CRO             |                       |
| JUN                          | 381 CRO            | 383 CRO             |                       |
| JUL                          | 375 CRO            | 378 CRO             |                       |
| AUG                          | 369 CRO            | 372 CRO             |                       |
| SEP                          | 353 CRO            | 354 CRO             |                       |
| OCT                          | 372 CRO            | 374 CRO             |                       |
| NOV                          | 400 CRO            | 401 CRO             |                       |
| DEC                          | 388 CRO            | 397 CRO             |                       |
| <hr/>                        |                    |                     |                       |
| TURBIDITY (FTU )             | DET'N LIMIT = .02  |                     | GUIDELINE = 1.00 (A1) |
| MAR                          | .100               | .100                |                       |
| APR                          | .070               | .050                |                       |
| MAY                          | .060               | .020                |                       |
| JUN                          | .130 <T            | .080 <T             |                       |
| JUL                          | .260               | .120                |                       |
| AUG                          | .090               | .150                |                       |
| SEP                          | .070 <T            | .060 <T             |                       |
| OCT                          | .040 <T            | .140                |                       |
| NOV                          | .080 <T            | .080 <T             |                       |
| DEC                          | .600               | .140                |                       |

TABLE 5

## DRINKING WATER SURVEILLANCE PROGRAM K 70 RECHARGE WELL, KITCHENER 1987

| WATER TREATMENT PLANT |         | DISTRIBUTION SYSTEM |                        |
|-----------------------|---------|---------------------|------------------------|
| RAW                   | TREATED |                     |                        |
| <hr/>                 |         |                     |                        |
| METALS                |         |                     |                        |
| ALUMINUM (MG/L )      |         | DET'N LIMIT = .004  | GUIDELINE = .10 (A4)   |
| MAR                   | BDL     | BDL                 |                        |
| APR                   | .040    | .033                |                        |
| MAY                   | BDL     | BDL                 |                        |
| JUN                   | BDL     | BDL                 |                        |
| JUL                   | BDL     | BDL                 |                        |
| AUG                   | BDL     | BDL                 |                        |
| SEP                   | BDL     | BDL                 |                        |
| OCT                   | BDL     | BDL                 |                        |
| NOV                   | BDL     | BDL                 |                        |
| DEC                   | BDL     | BDL                 |                        |
| <hr/>                 |         |                     |                        |
| BARIUM (MG/L )        |         | DET'N LIMIT = 0.001 | GUIDELINE = 1.000 (A1) |
| MAR                   | .024    | .024                |                        |
| APR                   | .019    | .018                |                        |
| MAY                   | .023    | .023                |                        |
| JUN                   | .022    | .022                |                        |
| JUL                   | .023    | .022                |                        |
| AUG                   | .026    | .026                |                        |
| SEP                   | .020    | .020                |                        |
| OCT                   | .020    | .020                |                        |
| NOV                   | .020    | .020                |                        |
| DEC                   | .023    | .020                |                        |
| <hr/>                 |         |                     |                        |
| BORON (MG/L )         |         | DET'N LIMIT = 0.01  | GUIDELINE = 5.000 (A1) |
| MAR                   | .030    | .030                |                        |
| APR                   | .040    | .030                |                        |
| MAY                   | .040 <T | .040 <T             |                        |
| JUN                   | .050    | .030                |                        |
| JUL                   | .030 <T | .030 <T             |                        |
| AUG                   | .040 <T | .040 <T             |                        |
| SEP                   | .030 <T | .020 <T             |                        |
| OCT                   | .030 <T | .030 <T             |                        |
| NOV                   | .046 <T | .052                |                        |
| DEC                   | .024 <T | .021 <T             |                        |
| <hr/>                 |         |                     |                        |
| COBALT (MG/L )        |         | DET'N LIMIT = 0.001 | GUIDELINE = 1.0 (H)    |
| MAR                   | BDL     | .001                |                        |
| APR                   | BDL     | BDL                 |                        |
| MAY                   | BDL     | .001                |                        |
| JUN                   | .001    | .002                |                        |
| JUL                   | .002    | .001                |                        |
| AUG                   | .002    | .001                |                        |



TABLE 5

## DRINKING WATER SURVEILLANCE PROGRAM K 70 RECHARGE WELL, KITCHENER 1987

| WATER TREATMENT PLANT |                     | DISTRIBUTION SYSTEM |                        |
|-----------------------|---------------------|---------------------|------------------------|
|                       | RAW                 | TREATED             |                        |
| <hr/>                 |                     |                     |                        |
| SEP                   | BDL                 | BDL                 |                        |
| OCT                   | BDL                 | BDL                 |                        |
| NOV                   | BDL                 | BDL                 |                        |
| DEC                   | BDL                 | BDL                 |                        |
| <hr/>                 |                     |                     |                        |
| CHROMIUM (MG/L )      | DET'N LIMIT = 0.001 |                     | GUIDELINE = .05 (A1)   |
| MAR                   | BDL                 | BDL                 |                        |
| APR                   | BDL                 | BDL                 |                        |
| MAY                   | BDL                 | BDL                 |                        |
| JUN                   | BDL                 | BDL                 |                        |
| JUL                   | BDL                 | BDL                 |                        |
| AUG                   | BDL                 | BDL                 |                        |
| SEP                   | BDL                 | BDL                 |                        |
| OCT                   | .003                | .003                |                        |
| NOV                   | .003                | .003                |                        |
| DEC                   | .003                | .003                |                        |
| <hr/>                 |                     |                     |                        |
| COPPER (MG/L )        | DET'N LIMIT = .001  |                     | GUIDELINE = 1.0 (A3)   |
| MAR                   | .003                | .130                |                        |
| APR                   | .002                | .074                |                        |
| MAY                   | .002                | .072                |                        |
| JUN                   | .003                | .077                |                        |
| JUL                   | .004                | .051                |                        |
| AUG                   | .005                | .074                |                        |
| SEP                   | .004                | .078                |                        |
| OCT                   | .005                | .120                |                        |
| NOV                   | .003                | .070                |                        |
| DEC                   | .004                | .046                |                        |
| <hr/>                 |                     |                     |                        |
| IRON (MG/L )          | DET'N LIMIT = .002  |                     | GUIDELINE = .300 (A3)  |
| MAR                   | .001                | .002                |                        |
| APR                   | BDL                 | BDL                 |                        |
| MAY                   | .050                | .008                |                        |
| JUN                   | .004                | .001                |                        |
| JUL                   | .008                | BDL                 |                        |
| AUG                   | .012                | .200                |                        |
| SEP                   | .003                | BDL                 |                        |
| OCT                   | BDL                 | BDL                 |                        |
| NOV                   | BDL                 | .005                |                        |
| DEC                   | BDL                 | BDL                 |                        |
| <hr/>                 |                     |                     |                        |
| MERCURY (UG/L )       | DET'N LIMIT = 0.010 |                     | GUIDELINE = 1.000 (A1) |
| MAR                   | BDL                 | BDL                 |                        |

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM K 70 RECHARGE WELL, KITCHENER 1987

## WATER TREATMENT PLANT

## DISTRIBUTION SYSTEM

RAW TREATED

|     |      |      |
|-----|------|------|
| APR | BDL  | BDL  |
| MAY | .010 | BDL  |
| JUN | .020 | .010 |
| JUL | .010 | .010 |
| AUG | .010 | .010 |
| SEP | .020 | .020 |
| OCT | .020 | .020 |
| NOV | .030 | .030 |
| DEC | .020 | .040 |

MANGANESE (MG/L )

DET'N LIMIT = .001

GUIDELINE = .050 (A3)

|     |      |      |
|-----|------|------|
| MAR | BDL  | BDL  |
| APR | BDL  | BDL  |
| MAY | BDL  | BDL  |
| JUN | .001 | .001 |
| JUL | .023 | .021 |
| AUG | .045 | .046 |
| SEP | .046 | .045 |
| OCT | .041 | .041 |
| NOV | .012 | .011 |
| DEC | .003 | .003 |

MOLYBDENUM (MG/L )

DET'N LIMIT = 0.001

GUIDELINE = .50 (H)

|     |      |      |
|-----|------|------|
| MAR | BDL  | .001 |
| APR | BDL  | BDL  |
| MAY | BDL  | BDL  |
| JUN | BDL  | BDL  |
| JUL | BDL  | BDL  |
| AUG | .001 | .001 |
| SEP | .001 | .001 |
| OCT | .001 | BDL  |
| NOV | BDL  | BDL  |
| DEC | BDL  | BDL  |

NICKEL (MG/L )

DET'N LIMIT = 0.001

GUIDELINE = .05 (F3)

|     |      |      |
|-----|------|------|
| MAR | BDL  | BDL  |
| APR | BDL  | BDL  |
| MAY | BDL  | BDL  |
| JUN | BDL  | BDL  |
| JUL | BDL  | BDL  |
| AUG | BDL  | BDL  |
| SEP | BDL  | BDL  |
| OCT | .002 | .002 |
| NOV | .001 | .001 |

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM K 70 RECHARGE WELL, KITCHENER 1987

| WATER TREATMENT PLANT |      | DISTRIBUTION SYSTEM |   |
|-----------------------|------|---------------------|---|
|                       | RAW  | TREATED             |   |
| <hr/>                 |      |                     |   |
| DEC                   | .001 | .001                |   |
| <hr/>                 |      |                     |   |
| STRONTIUM (MG/L )     |      |                     | DET'N LIMIT = .001      GUIDELINE = 2.00 (H)  |
| MAR                   | .570 | .570                |   |
| APR                   | .430 | .400                |   |
| MAY                   | .490 | .500                |   |
| JUN                   | .450 | .460                |   |
| JUL                   | .450 | .430                |   |
| AUG                   | .450 | .450                |   |
| SEP                   | .420 | .420                |   |
| OCT                   | .450 | .460                |   |
| NOV                   | .440 | .450                |   |
| DEC                   | .440 | .450                |   |
| <hr/>                 |      |                     |   |
| URANIUM (UG/L )       |      |                     | DET'N LIMIT = .02      GUIDELINE = 20. (A2)   |
| MAR                   | .850 | .850                |   |
| APR                   | .680 | .720                |   |
| MAY                   | .710 | .740                |   |
| JUN                   | .510 | .530                |   |
| JUL                   | .520 | .520                |   |
| AUG                   | .020 | .010                |   |
| SEP                   | .590 | .610                |   |
| OCT                   | .620 | .650                |   |
| NOV                   | .530 | .540                |   |
| DEC                   | .760 | .760                |   |
| <hr/>                 |      |                     |   |
| ZINC (MG/L )          |      |                     | DET'N LIMIT = .001      GUIDELINE = 5.00 (A3) |
| MAR                   | .003 | .003                |   |
| APR                   | .003 | .002                |   |
| MAY                   | .007 | .006                |   |
| JUN                   | .006 | .004                |   |
| JUL                   | .005 | .005                |   |
| AUG                   | .006 | .016                |   |
| SEP                   | .004 | .004                |   |
| OCT                   | .006 | .005                |   |
| NOV                   | .003 | .003                |   |
| DEC                   | .003 | .004                |   |

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM K 70 RECHARGE WELL, KITCHENER 1987

## WATER TREATMENT PLANT

## DISTRIBUTION SYSTEM

RAW

TREATED

## CHLOROAROMATICS

HEXACHLOROETHANE (NG/L )

DET'N LIMIT = 1.000

GUIDELINE = 1900. (D4)

|     |          |     |
|-----|----------|-----|
| MAR | BDL      | BDL |
| APR | BDL      | BDL |
| MAY | BDL      | BDL |
| JUN | 1.000 <T | BDL |
| JUL | BDL      | BDL |
| AUG | BDL      | BDL |
| SEP | BDL      | BDL |
| OCT | BDL      | BDL |
| NOV | BDL      | BDL |
| DEC | BDL      | BDL |

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM K 70 RECHARGE WELL, KITCHENER 1987

| WATER TREATMENT PLANT |            | DISTRIBUTION SYSTEM                              |
|-----------------------|------------|--|
| RAW                   | TREATED    |  |
| -----                 |            |  |
| SPECIFIC PESTICIDES   |            |  |
| ATRAZINE (NG/L )      |            | DET'N LIMIT = 50.00      GUIDELINE = 60000. (B3) |
| MAR                   | 240.000 <T | 270.000 <T                                       |
| APR                   | BDL        | 140.000 <T                                       |
| MAY                   | 370.000 <T | 220.000 <T                                       |
| JUN                   | BDL        | BDL  |
| JUL                   | BDL        | !NR  |
| AUG                   | BDL        | BDL  |
| SEP                   | BDL        | BDL  |
| OCT                   | !NR        | BDL  |
| NOV                   | 170.000 <T | 170.000 <T                                       |
| DEC                   | BDL        | BDL  |

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM K 70 RECHARGE WELL, KITCHENER 1987

## WATER TREATMENT PLANT

## DISTRIBUTION SYSTEM

RAW

TREATED

## PHENOLICS

PHENOL (UG/L )

DET'N LIMIT = 0.2

GUIDELINE = 2.00 (A3)

|     |           |           |
|-----|-----------|-----------|
| MAR | BDL       | BDL       |
| APR | 7.000 CIC | 2.800 CIC |
| MAY | BDL       | BDL       |
| JUN | .200 <T   | .400 <T   |
| JUL | BDL       | BDL       |
| AUG | .800 <T   | BDL       |
| SEP | BDL       | BDL       |
| OCT | BDL       | BDL       |
| NOV | BDL       | BDL       |
| DEC | BDL       | .200 <T   |

TABLE 5

## DRINKING WATER SURVEILLANCE PROGRAM K 70 RECHARGE WELL, KITCHENER 1987

| WATER TREATMENT PLANT |                 |          | DISTRIBUTION SYSTEM |      |
|-----------------------|-----------------|----------|---------------------|------|
|                       | RAW             | TREATED  |                     |      |
| <hr/>                 |                 |          |                     |      |
| VOLATILES             |                 |          |                     |      |
| BENZENE (UG/L )       | DET'N LIMIT = 0 |          | GUIDELINE = 5.0     | (D1) |
| MAR                   | BDL             | BDL      |                     |      |
| APR                   | BDL             | BDL      |                     |      |
| MAY                   | BDL             | BDL      |                     |      |
| JUN                   | BDL             | BDL      |                     |      |
| JUL                   | BDL             | BDL      |                     |      |
| AUG                   | BDL             | BDL      |                     |      |
| SEP                   | BDL             | BDL      |                     |      |
| OCT                   | BDL             | BDL      |                     |      |
| NOV                   | .050 <T         | .050 <T  |                     |      |
| DEC                   | BDL             | BDL      |                     |      |
| <hr/>                 |                 |          |                     |      |
| TOLUENE (UG/L )       | DET'N LIMIT = 0 |          | GUIDELINE = 100.0   | (G)  |
| MAR                   | BDL             | BDL      |                     |      |
| APR                   | BDL             | BDL      |                     |      |
| MAY                   | BDL             | BDL      |                     |      |
| JUN                   | BDL             | BDL      |                     |      |
| JUL                   | BDL             | BDL      |                     |      |
| AUG                   | BDL             | BDL      |                     |      |
| SEP                   | BDL             | BDL      |                     |      |
| OCT                   | .050 UCS        | .050 UCS |                     |      |
| NOV                   | .150 UCS        | .250 <T  |                     |      |
| DEC                   | BDL             | BDL      |                     |      |
| <hr/>                 |                 |          |                     |      |
| ETHYLBENZENE (UG/L )  | DET'N LIMIT = 0 |          | GUIDELINE = 3400.   | (D3) |
| MAR                   | BDL             | BDL      |                     |      |
| APR                   | BDL             | BDL      |                     |      |
| MAY                   | BDL             | BDL      |                     |      |
| JUN                   | BDL             | BDL      |                     |      |
| JUL                   | BDL             | .150 <T  |                     |      |
| AUG                   | .350 <T         | BDL      |                     |      |
| SEP                   | BDL             | BDL      |                     |      |
| OCT                   | .100 <T         | BDL      |                     |      |
| NOV                   | .050 <T         | .050 <T  |                     |      |
| DEC                   | BDL             | BDL      |                     |      |
| <hr/>                 |                 |          |                     |      |
| P-XYLENE (UG/L )      | DET'N LIMIT = 0 |          | GUIDELINE = 620.    | (G)  |
| MAR                   | BDL             | BDL      |                     |      |
| APR                   | BDL             | BDL      |                     |      |
| MAY                   | BDL             | BDL      |                     |      |
| JUN                   | BDL             | BDL      |                     |      |
| JUL                   | BDL             | BDL      |                     |      |
| AUG                   | BDL             | BDL      |                     |      |

TABLE 5

## DRINKING WATER SURVEILLANCE PROGRAM K 70 RECHARGE WELL, KITCHENER 1987

| WATER TREATMENT PLANT        |         |          | DISTRIBUTION SYSTEM |                         |
|------------------------------|---------|----------|---------------------|-------------------------|
|                              | RAW     | TREATED  |                     |                         |
| SEP                          | BDL     | BDL      |                     |                         |
| OCT                          | BDL     | BDL      |                     |                         |
| NOV                          | BDL     | .000 RMP |                     |                         |
| DEC                          | BDL     | BDL      |                     |                         |
| M-XYLENE (UG/L )             |         |          | DET'N LIMIT = 0     | GUIDELINE = 620. (G)    |
| MAR                          | BDL     | BDL      |                     |                         |
| APR                          | BDL     | BDL      |                     |                         |
| MAY                          | BDL     | BDL      |                     |                         |
| JUN                          | BDL     | BDL      |                     |                         |
| JUL                          | BDL     | BDL      |                     |                         |
| AUG                          | BDL     | BDL      |                     |                         |
| SEP                          | BDL     | BDL      |                     |                         |
| OCT                          | BDL     | BDL      |                     |                         |
| NOV                          | BDL     | .150 <T  |                     |                         |
| DEC                          | BDL     | BDL      |                     |                         |
| CHLOROFORM (UG/L )           |         |          | DET'N LIMIT = 0     | GUIDELINE = 350.0 (A1+) |
| MAR                          | BDL     | 11.000   |                     |                         |
| APR                          | BDL     | 9.000    |                     |                         |
| MAY                          | BDL     | 9.000    |                     |                         |
| JUN                          | BDL     | 7.800    |                     |                         |
| JUL                          | BDL     | 3.000    |                     |                         |
| AUG                          | BDL     | 3.200    |                     |                         |
| SEP                          | BDL     | 3.900    |                     |                         |
| OCT                          | BDL     | 7.400    |                     |                         |
| NOV                          | .200 <T | 3.500    |                     |                         |
| DEC                          | BDL     | 1.200    |                     |                         |
| DICHLOROBROMOMETHANE (UG/L ) |         |          | DET'N LIMIT = 0     | GUIDELINE = 350.0 (A1+) |
| MAR                          | BDL     | 9.000    |                     |                         |
| APR                          | BDL     | 6.000    |                     |                         |
| MAY                          | BDL     | 5.000    |                     |                         |
| JUN                          | BDL     | 3.200    |                     |                         |
| JUL                          | BDL     | .450 <T  |                     |                         |
| AUG                          | BDL     | .000 APS |                     |                         |
| SEP                          | BDL     | .600     |                     |                         |
| OCT                          | BDL     | 3.100    |                     |                         |
| NOV                          | BDL     | .950     |                     |                         |
| DEC                          | BDL     | .100 <T  |                     |                         |
| CHLORODIBROMOMETHANE (UG/L ) |         |          | DET'N LIMIT = 0     | GUIDELINE = 350.0 (A1+) |
| MAR                          | BDL     | 4.000    |                     |                         |



TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM K 70 RECHARGE WELL, KITCHENER 1987

| WATER TREATMENT PLANT        |      | DISTRIBUTION SYSTEM    |
|------------------------------|------|------------------------|
|                              | RAW  | TREATED                |
| -----                        |      |                        |
| APR                          | BDL  | 3.000                  |
| MAY                          | BDL  | 2.000                  |
| JUN                          | BDL  | 1.100                  |
| JUL                          | BDL  | BDL                    |
| AUG                          | BDL  | BDL                    |
| SEP                          | BDL  | .100 <T                |
| OCT                          | BDL  | .900 <T                |
| NOV                          | BDL  | .200 <T                |
| DEC                          | BDL  | BDL                    |
| -----                        |      |                        |
| TOTL TRIHALOMETHANES (UG/L ) |      | DET'N LIMIT = 0        |
|                              |      | GUIDELINE = 350.0 (A1) |
| MAR                          | BDL  | 24.000                 |
| APR                          | BDL  | 18.000                 |
| MAY                          | BDL  | 16.000                 |
| JUN                          | BDL  | 12.100                 |
| JUL                          | BDL  | 3.450                  |
| AUG                          | BDL  | 3.200                  |
| SEP                          | BDL  | 4.600                  |
| OCT                          | BDL  | 11.400                 |
| NOV                          | .200 | 4.650                  |
| DEC                          | BDL  | 1.300                  |
| -----                        |      |                        |

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM KITCHENER WELL SUPPLY K21, MANNHEIM RES 1987

| WATER TREATMENT PLANT         |         | DISTRIBUTION SYSTEM |                         |
|-------------------------------|---------|---------------------|-------------------------|
| RAW                           | TREATED |                     |                         |
| <hr/>                         |         |                     |                         |
| BACTERIOLOGICAL               |         |                     |                         |
| AEROMONAS SP (0=ABSENT )      |         | DET'N LIMIT = N/A   | GUIDELINE = 0 (A1)      |
| OCT                           | 0       |                     |                         |
| <hr/>                         |         |                     |                         |
| E. COLI (P/A) (0=ABSENT )     |         | DET'N LIMIT = N/A   | GUIDELINE =             |
| OCT                           | 0       |                     |                         |
| <hr/>                         |         |                     |                         |
| FECAL COLIFORM MF (CT/100ML ) |         | DET'N LIMIT = 0     | GUIDELINE = 0 (A1)      |
| MAR                           | 0       | .                   |                         |
|                               | 0       | .                   |                         |
| APR                           | 0       | .                   |                         |
| MAY                           | 0       | .                   |                         |
| JUN                           | 0       | .                   |                         |
| JUL                           | 0       | .                   |                         |
| AUG                           | 0       | .                   |                         |
| SEP                           | 0       | .                   |                         |
| OCT                           | 0       | .                   |                         |
| NOV                           | 0       | .                   |                         |
| DEC                           | 0       | .                   |                         |
| <hr/>                         |         |                     |                         |
| FECAL COLIFORM (0=ABSENT )    |         | DET'N LIMIT = N/A   | GUIDELINE = 0 (A1)      |
| OCT                           | 0       |                     |                         |
| <hr/>                         |         |                     |                         |
| STANDRD PLATE CNT MF (CT/ML ) |         | DET'N LIMIT = 0     | GUIDELINE = 500/ML (A1) |
| MAR                           | 20      | 0                   |                         |
|                               | 13      | 0                   |                         |
| APR                           | 0       | 3                   |                         |
| MAY                           | 6       | !LA                 |                         |
| JUN                           | 1       | 6                   |                         |
| JUL                           | 5       | 1                   |                         |
| AUG                           | 18      | 4                   |                         |
| SEP                           | 2       | 2                   |                         |
| OCT                           | 1       | 1                   |                         |
| NOV                           | 1       | 1                   |                         |
| DEC                           | !AW     | !AW                 |                         |
| <hr/>                         |         |                     |                         |
| P/A BOTTLE (0=ABSENT )        |         | DET'N LIMIT = 0     | GUIDELINE = 0 (A1*)     |
| MAR                           | .       | 0                   |                         |
|                               | .       | 0                   |                         |
| APR                           | .       | 0                   |                         |
| MAY                           | .       | 0                   |                         |
| JUN                           | .       | 0                   |                         |

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM KITCHENER WELL SUPPLY K21, MANNHEIM RES 1987

| WATER TREATMENT PLANT            |     |                   | DISTRIBUTION SYSTEM     |
|----------------------------------|-----|-------------------|-------------------------|
|                                  | RAW | TREATED           |                         |
| <hr/>                            |     |                   |                         |
| JUL                              | .   | 0                 |                         |
| AUG                              | .   | 0                 |                         |
| SEP                              | .   | 0                 |                         |
| OCT                              | .   | 1                 |                         |
| NOV                              | .   | 0                 |                         |
| DEC                              | .   | 0                 |                         |
| <hr/>                            |     |                   |                         |
| STAPH AUREUS (0=ABSENT )         |     | DET'N LIMIT = N/A | GUIDELINE = 0 (A1)      |
| OCT                              | .   | 0                 |                         |
| <hr/>                            |     |                   |                         |
| COLIFORM (0=ABSENT )             |     | DET'N LIMIT = N/A | GUIDELINE = 0 (A1)      |
| OCT                              | .   | 0                 |                         |
| <hr/>                            |     |                   |                         |
| TOTAL COLIFORM MF (CT/100ML )    |     | DET'N LIMIT = 0   | GUIDELINE = 5/100ML(A1) |
| MAR                              | 0   | 0                 |                         |
|                                  | BDL | 0                 |                         |
| APR                              | 0   | 0                 |                         |
| MAY                              | 4   | 0                 |                         |
| JUN                              | BDL | 0                 |                         |
| JUL                              | 2   | 0                 |                         |
| AUG                              | BDL | 1                 |                         |
| SEP                              | 0   | 0                 |                         |
| OCT                              | 0   | 0                 |                         |
| NOV                              | 0   | 0                 |                         |
| DEC                              | 0   | 0                 |                         |
| <hr/>                            |     |                   |                         |
| T COLIFORM BCKGRD MF (CT/100ML ) |     | DET'N LIMIT = 0   | GUIDELINE = N/A         |
| MAR                              | 0   | 0                 |                         |
|                                  | 2   | 0                 |                         |
| APR                              | 0   | 0                 |                         |
| MAY                              | 31  | 3                 |                         |
| JUN                              | BDL | 0                 |                         |
| JUL                              | 4   | 1                 |                         |
| AUG                              | BDL | 1                 |                         |
| SEP                              | 0   | 0                 |                         |
| OCT                              | 0   | 3                 |                         |
| NOV                              | 0   | 0                 |                         |
| DEC                              | 0   | 0                 |                         |

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM KITCHENER WELL SUPPLY K21, MANNHEIM RES 1987

| WATER TREATMENT PLANT       |         | DISTRIBUTION SYSTEM |                          |
|-----------------------------|---------|---------------------|--------------------------|
| RAW                         | TREATED |                     |                          |
| -----                       |         |                     |                          |
| CHEMISTRY (FLD)             |         |                     |                          |
| FLD CHLORINE (COMB) (MG/L ) |         | DET'N LIMIT = N/A   | GUIDELINE = N/A          |
| MAR                         | .100    |                     |                          |
|                             | .100    |                     |                          |
| APR                         | .100    |                     |                          |
| MAY                         | .100    |                     |                          |
| -----                       |         |                     |                          |
| TOTAL CHLORINE (MG/L )      |         | DET'N LIMIT = N/A   | GUIDELINE = N/A          |
| MAR                         | .100    |                     |                          |
|                             | .100    |                     |                          |
| APR                         | .100    |                     |                          |
| MAY                         | .100    |                     |                          |
| JUN                         | .100    |                     |                          |
| JUL                         | .100    |                     |                          |
| AUG                         | .100    |                     |                          |
| OCT                         | .100    |                     |                          |
| DEC                         | .100    |                     |                          |
| -----                       |         |                     |                          |
| FLD PH (DMSNLESS )          |         | DET'N LIMIT = N/A   | GUIDELINE = 6.5-8.5 (A4) |
| MAR                         | 7.500   | 7.500               |                          |
|                             | 7.500   | 7.500               |                          |
| APR                         | 7.500   | 7.500               |                          |
| MAY                         | 7.500   | 7.500               |                          |
| JUN                         | 7.500   | 7.400               |                          |
| JUL                         | 7.500   | 7.500               |                          |
| AUG                         | 7.500   | 7.500               |                          |
| SEP                         | 7.500   | 7.500               |                          |
| OCT                         | 7.500   | 7.500               |                          |
| NOV                         | 7.500   | 7.500               |                          |
| DEC                         | 7.300   | 7.500               |                          |
| -----                       |         |                     |                          |
| TEMPERATURE (DEG.C )        |         | DET'N LIMIT = N/A   | GUIDELINE = N/A          |
| MAR                         | 10.000  | 9.500               |                          |
|                             | 9.000   | 8.000               |                          |
| APR                         | 7.000   | 7.000               |                          |
| MAY                         | 8.500   | 8.000               |                          |
| JUN                         | 10.000  | 9.000               |                          |
| JUL                         | 8.000   | 9.000               |                          |
| AUG                         | 9.000   | 9.000               |                          |
| SEP                         | 10.000  | 10.000              |                          |
| OCT                         | 9.000   | 8.000               |                          |
| NOV                         | 9.000   | 8.500               |                          |
| DEC                         | 8.000   | 8.000               |                          |

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM KITCHENER WELL SUPPLY K21, MANNHEIM RES 1987

| WATER TREATMENT PLANT |          | DISTRIBUTION SYSTEM |                         |
|-----------------------|----------|---------------------|-------------------------|
|                       | RAW      | TREATED             |                         |
| -----                 |          |                     |                         |
| CHEMISTRY (LAB)       |          |                     |                         |
| ALKALINITY (MG/L )    |          | DET'N LIMIT = .200  | GUIDELINE = 30-500 (A4) |
| MAR                   | 272.200  | 264.000             |                         |
|                       | 274.100  | 263.000             |                         |
| APR                   | 268.700  | 258.500             |                         |
| MAY                   | 273.300  | !UR                 |                         |
| JUN                   | 272.300  | 261.600             |                         |
| JUL                   | 273.900  | 266.400             |                         |
| AUG                   | 277.300  | 265.500             |                         |
| SEP                   | 257.700  | 258.800             |                         |
| OCT                   | 276.000  | 264.200             |                         |
| NOV                   | 276.900  | 267.700             |                         |
| DEC                   | 247.400  | 224.700             |                         |
| -----                 |          |                     |                         |
| CALCIUM (MG/L )       |          | DET'N LIMIT = .100  | GUIDELINE = 100. (F2)   |
| MAR                   | 86.300   | 90.900              |                         |
|                       | 83.200   | 87.600              |                         |
| APR                   | 89.000   | 94.000              |                         |
| MAY                   | 86.000   | !UR                 |                         |
| JUN                   | 88.600   | 91.600              |                         |
| JUL                   | 87.600   | 86.000              |                         |
| AUG                   | 87.400   | 91.400              |                         |
| SEP                   | 81.400   | 89.600              |                         |
| OCT                   | 84.600   | 91.800              |                         |
| NOV                   | 83.000   | 83.200              |                         |
| DEC                   | 74.800   | 74.400              |                         |
| -----                 |          |                     |                         |
| CHLORIDE (MG/L )      |          | DET'N LIMIT = .200  | GUIDELINE = 250.0 (A3)  |
| MAR                   | 14.500   | 18.500              |                         |
|                       | 15.000   | 19.000              |                         |
| APR                   | 14.500   | 18.500              |                         |
| MAY                   | 15.000   | !UR                 |                         |
| JUN                   | 15.000   | 18.500              |                         |
| JUL                   | 15.000   | 18.500              |                         |
| AUG                   | 15.500   | 18.500              |                         |
| SEP                   | 15.500   | 19.000              |                         |
| OCT                   | 15.900   | 19.300              |                         |
| NOV                   | 15.700   | 19.200              |                         |
| DEC                   | 15.500   | 18.400              |                         |
| -----                 |          |                     |                         |
| COLOUR (TCU )         |          | DET'N LIMIT = .5    | GUIDELINE = 5.0 (A3)    |
| MAR                   | 1.500 <T | 1.500 <T            |                         |
|                       | 1.000 <T | 1.000 <T            |                         |
| APR                   | .500 <T  | .500 <T             |                         |

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM KITCHENER WELL SUPPLY K21, MANNHEIM RES 1987

## WATER TREATMENT PLANT

## DISTRIBUTION SYSTEM

RAW TREATED

|     |         |         |
|-----|---------|---------|
| MAY | 26.000  | !UR     |
| JUN | BDL     | BDL     |
| JUL | BDL     | BDL     |
| AUG | .500 <T | .500 <T |
| SEP | .500 <T | .500 <T |
| OCT | .500 <T | .500 <T |
| NOV | BDL     | BDL     |
| DEC | .500 <T | .500 <T |

CONDUCTIVITY (UMHO/CM )

DET'N LIMIT = 1

GUIDELINE = 400. (F2)

|     |     |     |
|-----|-----|-----|
| MAR | 595 | 613 |
|     | 632 | 650 |
| APR | 639 | 657 |
| MAY | 632 | !UR |
| JUN | 627 | 635 |
| JUL | 628 | 639 |
| AUG | 632 | 644 |
| SEP | 588 | 614 |
| OCT | 624 | 632 |
| NOV | 631 | 642 |
| DEC | 570 | 567 |

FLUORIDE (MG/L )

DET'N LIMIT = .01

GUIDELINE = 2.400 (A1)

|     |      |      |
|-----|------|------|
| MAR | .140 | .090 |
|     | .120 | .080 |
| APR | .130 | .100 |
| MAY | .110 | !UR  |
| JUN | .140 | .100 |
| JUL | .120 | .080 |
| AUG | .070 | .140 |
| SEP | .100 | .080 |
| OCT | .120 | .080 |
| NOV | .100 | .060 |
| DEC | .100 | .080 |

HARDNESS (MG/L )

DET'N LIMIT = .500

GUIDELINE = 80-100 (A4)

|     |         |         |
|-----|---------|---------|
| MAR | 326.000 | 329.000 |
|     | 321.000 | 324.500 |
| APR | 330.500 | 337.000 |
| MAY | 330.000 | !UR     |
| JUN | 336.000 | 336.000 |
| JUL | 334.000 | 322.000 |
| AUG | 330.000 | 333.000 |
| SEP | 319.000 | 333.000 |

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM KITCHENER WELL SUPPLY K21, MANNHEIM RES 1987

| WATER TREATMENT PLANT  |         |         | DISTRIBUTION SYSTEM |                        |
|------------------------|---------|---------|---------------------|------------------------|
|                        | RAW     | TREATED |                     |                        |
| <hr/>                  |         |         |                     |                        |
| OCT                    | 325.000 | 335.000 |                     |                        |
| NOV                    | 320.000 | 315.000 |                     |                        |
| DEC                    | 300.000 | 293.000 |                     |                        |
| <hr/>                  |         |         |                     |                        |
| MAGNESIUM (MG/L )      |         |         | DET'N LIMIT = .050  | GUIDELINE = 30. (F2)   |
| MAR                    | 26.900  | 24.800  |                     |                        |
|                        | 27.500  | 25.600  |                     |                        |
| APR                    | 26.300  | 24.900  |                     |                        |
| MAY                    | 28.000  | !UR     |                     |                        |
| JUN                    | 27.900  | 26.000  |                     |                        |
| JUL                    | 28.000  | 26.100  |                     |                        |
| AUG                    | 27.200  | 25.300  |                     |                        |
| SEP                    | 28.000  | 26.500  |                     |                        |
| OCT                    | 27.600  | 25.500  |                     |                        |
| NOV                    | 27.300  | 26.100  |                     |                        |
| DEC                    | 27.600  | 26.200  |                     |                        |
| <hr/>                  |         |         |                     |                        |
| SODIUM (MG/L )         |         |         | DET'N LIMIT = .200  | GUIDELINE = 200. (C3)  |
| MAR                    | 8.300   | 8.600   |                     |                        |
|                        | 8.300   | 8.500   |                     |                        |
| APR                    | 8.200   | 8.500   |                     |                        |
| MAY                    | 8.200   | !UR     |                     |                        |
| JUN                    | 8.800   | 7.600   |                     |                        |
| JUL                    | 8.200   | 7.800   |                     |                        |
| AUG                    | 8.200   | 8.200   |                     |                        |
| SEP                    | 9.000   | 8.600   |                     |                        |
| OCT                    | 9.000   | 8.800   |                     |                        |
| NOV                    | 9.000   | 9.400   |                     |                        |
| DEC                    | 9.000   | 8.800   |                     |                        |
| <hr/>                  |         |         |                     |                        |
| AMMONIUM TOTAL (MG/L ) |         |         | DET'N LIMIT = 0.002 | GUIDELINE = .05 (F2)   |
| MAR                    | BDL     | BDL     |                     |                        |
|                        | .006 <T | .010    |                     |                        |
| APR                    | .002 <T | .002 <T |                     |                        |
| MAY                    | BDL     | !UR     |                     |                        |
| JUN                    | .002 <T | .004 <T |                     |                        |
| JUL                    | BDL     | .020    |                     |                        |
| AUG                    | .010    | .008 <T |                     |                        |
| SEP                    | BDL     | BDL     |                     |                        |
| OCT                    | BDL     | .012    |                     |                        |
| NOV                    | .012    | .008 <T |                     |                        |
| DEC                    | BDL     | BDL     |                     |                        |
| <hr/>                  |         |         |                     |                        |
| NITRITE (MG/L )        |         |         | DET'N LIMIT = 0.001 | GUIDELINE = 1.000 (A1) |

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM KITCHENER WELL SUPPLY K21, MANNHEIM RES 1987

## WATER TREATMENT PLANT

## DISTRIBUTION SYSTEM

RAW TREATED

|     |         |         |
|-----|---------|---------|
| MAR | .010    | .001 <T |
|     | .009    | .002 <T |
| APR | .008    | BDL     |
| MAY | .008    | IUR     |
| JUN | .011    | .004 <T |
| JUL | .005    | .001 <T |
| AUG | .009    | .005    |
| SEP | .009    | .003 <T |
| OCT | .004 <T | BDL     |
| NOV | .030    | .011    |
| DEC | .004 <T | BDL     |

TOTAL NITRATES (MG/L )

DET'N LIMIT = .020

GUIDELINE = 10.000 (A1)

|     |      |       |
|-----|------|-------|
| MAR | .550 | 3.860 |
|     | .590 | 3.850 |
| APR | .575 | 4.000 |
| MAY | .620 | IUR   |
| JUN | .570 | 3.760 |
| JUL | .610 | 3.760 |
| AUG | .585 | 3.710 |
| SEP | .595 | 3.750 |
| OCT | .630 | 3.920 |
| NOV | .630 | 3.780 |
| DEC | .635 | 3.760 |

NITROGEN TOT KJELD (MG/L )

DET'N LIMIT = .020

GUIDELINE = N/A

|     |         |         |
|-----|---------|---------|
| MAR | .040 <T | .120    |
|     | BDL     | IUR     |
| APR | BDL     | .060 <T |
| MAY | BDL     | IUR     |
| JUN | .030 <T | .050 <T |
| JUL | .020 <T | .070 <T |
| AUG | .040 <T | .160    |
| SEP | .020 <T | .050 <T |
| OCT | .060 <T | .070 <T |
| NOV | .070 <T | .070 <T |
| DEC | .030 <T | .060 <T |

PH (DMSNLESS )

DET'N LIMIT = N/A

GUIDELINE = 6.5-8.5(A4)

|     |       |       |
|-----|-------|-------|
| MAR | 8.030 | 8.040 |
|     | 7.960 | 8.110 |
| APR | 7.910 | 8.000 |
| MAY | 8.080 | IUR   |
| JUN | 8.150 | 8.210 |



TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM KITCHENER WELL SUPPLY K21, MANNHEIM RES 1987

| WATER TREATMENT PLANT        |                      | DISTRIBUTION SYSTEM |                       |
|------------------------------|----------------------|---------------------|-----------------------|
|                              | RAW                  | TREATED             |                       |
| <hr/>                        |                      |                     |                       |
| JUL                          | 8.030                | 8.070               |                       |
| AUG                          | 8.020                | 8.080               |                       |
| SEP                          | 8.120                | 8.170               |                       |
| OCT                          | 8.090                | 8.210               |                       |
| NOV                          | 8.230                | 8.260               |                       |
| DEC                          | 8.270                | 8.120               |                       |
| <hr/>                        |                      |                     |                       |
| PHOSPHORUS FIL REACT (MG/L ) | DET'N LIMIT = .5UG/L |                     | GUIDELINE = N/A       |
| MAR                          | .002 <T              | .001 <T             |                       |
|                              | .001 <T              | .000 <T             |                       |
| APR                          | .000 <T              | .002 <T             |                       |
| MAY                          | .002 <T              | !UR                 |                       |
| JUN                          | .001 <T              | .001 <T             |                       |
| JUL                          | .002 <T              | .001 <T             |                       |
| AUG                          | .000 <T              | .000 <T             |                       |
| SEP                          | .001 <T              | .001 <T             |                       |
| OCT                          | .000 <T              | .002 <T             |                       |
| NOV                          | .003                 | .002                |                       |
| DEC                          | BDL                  | BDL                 |                       |
| <hr/>                        |                      |                     |                       |
| PHOSPHORUS TTL-UNFIL (MG/L ) | DET'N LIMIT = .002   |                     | GUIDELINE = .40 (F2)  |
| MAR                          | .003 <T              | .005 <T             |                       |
|                              | .003 <T              | !CR                 |                       |
| APR                          | BDL                  | .002 <T             |                       |
| MAY                          | .002 <T              | !UR                 |                       |
| JUN                          | .005 <T              | .002 <T             |                       |
| JUL                          | BDL                  | .003 <T             |                       |
| AUG                          | BDL                  | .004 <T             |                       |
| SEP                          | .019                 | .003 <T             |                       |
| OCT                          | BDL                  | BDL                 |                       |
| NOV                          | BDL                  | .002 <T             |                       |
| DEC                          | BDL                  | BDL                 |                       |
| <hr/>                        |                      |                     |                       |
| RESIDUE (TOTAL) (MG/L )      | DET'N LIMIT = 1.     |                     | GUIDELINE = 500. (A3) |
| MAR                          | 399                  | 407                 |                       |
|                              | 142                  | 145                 |                       |
| APR                          | 331                  | 349                 |                       |
| MAY                          | 411 CRO              | !UR                 |                       |
| JUN                          | 408 CRO              | 413 CRO             |                       |
| JUL                          | 408 CRO              | 415 CRO             |                       |
| AUG                          | 411 CRO              | 419 CRO             |                       |
| SEP                          | 382 CRO              | 399 CRO             |                       |
| OCT                          | 406 CRO              | 411 CRO             |                       |
| NOV                          | 410 CRO              | 417 CRO             |                       |

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM KITCHENER WELL SUPPLY K21, MANNHEIM RES 1987

## WATER TREATMENT PLANT

## DISTRIBUTION SYSTEM

RAW

TREATED

| -----            |                   |         |                       |
|------------------|-------------------|---------|-----------------------|
| DEC              | 371 CRO           | 369 CRO |                       |
| -----            |                   |         |                       |
| TURBIDITY (FTU ) | DET'N LIMIT = .02 |         | GUIDELINE = 1.00 (A1) |
| MAR              | .100              | .200    |                       |
|                  | .040              | .040    |                       |
| APR              | .050              | .080    |                       |
| MAY              | .050              | !UR     |                       |
| JUN              | .090 <T           | .060 <T |                       |
| JUL              | .090              | .120    |                       |
| AUG              | .110              | .070    |                       |
| SEP              | .090 <T           | .080 <T |                       |
| OCT              | .040 <T           | .030 <T |                       |
| NOV              | .100 <T           | .100 <T |                       |
| DEC              | .100              | .040 <T |                       |

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM KITCHENER WELL SUPPLY K21, MANNHEIM RES 1987

| WATER TREATMENT PLANT |         | DISTRIBUTION SYSTEM |                        |
|-----------------------|---------|---------------------|------------------------|
| RAW                   | TREATED |                     |                        |
| <hr/>                 |         |                     |                        |
| METALS                |         |                     |                        |
| ALUMINUM (MG/L )      |         | DET'N LIMIT = .004  | GUIDELINE = .10 (A4)   |
| MAR                   | BDL     | BDL                 |                        |
|                       | .036    | .033                |                        |
| APR                   | .034    | .035                |                        |
| MAY                   | BDL     | BDL                 |                        |
| JUN                   | BDL     | BDL                 |                        |
| JUL                   | BDL     | BDL                 |                        |
| AUG                   | BDL     | BDL                 |                        |
| SEP                   | BDL     | BDL                 |                        |
| OCT                   | BDL     | BDL                 |                        |
| NOV                   | BDL     | .005                |                        |
| DEC                   | BDL     | BDL                 |                        |
| <hr/>                 |         |                     |                        |
| BARIUM (MG/L )        |         | DET'N LIMIT = 0.001 | GUIDELINE = 1.000 (A1) |
| MAR                   | .091    | .091                |                        |
|                       | .086    | .084                |                        |
| APR                   | .077    | .082                |                        |
| MAY                   | .083    | .090                |                        |
| JUN                   | .089    | .090                |                        |
| JUL                   | .092    | .089                |                        |
| AUG                   | .100    | .100                |                        |
| SEP                   | .083    | .083                |                        |
| OCT                   | .081    | .082                |                        |
| NOV                   | .083    | .083                |                        |
| DEC                   | .079    | .079                |                        |
| <hr/>                 |         |                     |                        |
| BORON (MG/L )         |         | DET'N LIMIT = 0.01  | GUIDELINE = 5.000 (A1) |
| MAR                   | .040    | .030                |                        |
|                       | .040    | .030                |                        |
| APR                   | .030    | .030                |                        |
| MAY                   | .050 <T | .040 <T             |                        |
| JUN                   | .020    | .040                |                        |
| JUL                   | .030 <T | .030 <T             |                        |
| AUG                   | .030 <T | .030 <T             |                        |
| SEP                   | .020 <T | .010 <T             |                        |
| OCT                   | .120 <T | .020 <T             |                        |
| NOV                   | .050    | .034 <T             |                        |
| DEC                   | .038 <T | .025 <T             |                        |
| <hr/>                 |         |                     |                        |
| CADMIUM (UG/L )       |         | DET'N LIMIT = 0.300 | GUIDELINE = 5.000 (A1) |
| MAR                   | BDL     | BDL                 |                        |
|                       | BDL     | BDL                 |                        |
| APR                   | BDL     | BDL                 |                        |

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM KITCHENER WELL SUPPLY K21, MANNHEIM RES 1987

## WATER TREATMENT PLANT

## DISTRIBUTION SYSTEM

RAW TREATED

|     |      |      |
|-----|------|------|
| MAY | BDL  | BDL  |
| JUN | BDL  | BDL  |
| JUL | BDL  | BDL  |
| AUG | .300 | .400 |
| SEP | BDL  | BDL  |
| OCT | BDL  | BDL  |
| NOV | BDL  | BDL  |
| DEC | BDL  | BDL  |

COBALT (MG/L )

DET'N LIMIT = 0.001

GUIDELINE = 1.0 (H)

|     |      |      |
|-----|------|------|
| MAR | BDL  | BDL  |
|     | .001 | .001 |
| APR | BDL  | BDL  |
| MAY | .001 | .001 |
| JUN | BDL  | BDL  |
| JUL | .001 | .001 |
| AUG | .002 | .002 |
| SEP | .001 | .001 |
| OCT | .002 | .002 |
| NOV | .002 | .002 |
| DEC | .002 | .002 |

CHROMIUM (MG/L )

DET'N LIMIT = 0.001

GUIDELINE = .05 (A1)

|     |      |      |
|-----|------|------|
| MAR | BDL  | BDL  |
|     | BDL  | BDL  |
| APR | BDL  | BDL  |
| MAY | BDL  | BDL  |
| JUN | BDL  | BDL  |
| JUL | BDL  | BDL  |
| AUG | BDL  | BDL  |
| SEP | BDL  | BDL  |
| OCT | .003 | .003 |
| NOV | .005 | .004 |
| DEC | .004 | .004 |

COPPER (MG/L )

DET'N LIMIT = .001

GUIDELINE = 1.0 (A3)

|     |      |      |
|-----|------|------|
| MAR | .001 | .002 |
|     | .002 | .001 |
| APR | BDL  | BDL  |
| MAY | BDL  | .001 |
| JUN | BDL  | .001 |
| JUL | .001 | .001 |
| AUG | .002 | .002 |
| SEP | BDL  | .001 |

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM KITCHENER WELL SUPPLY K21, MANNHEIM RES 1987

| WATER TREATMENT PLANT |                     |         | DISTRIBUTION SYSTEM |      |
|-----------------------|---------------------|---------|---------------------|------|
|                       | RAW                 | TREATED |                     |      |
| -----                 |                     |         |                     |      |
| OCT                   | .001                | .002    |                     |      |
| NOV                   | .001                | .003    |                     |      |
| DEC                   | .002                | .002    |                     |      |
| -----                 |                     |         |                     |      |
| IRON (MG/L )          | DET'N LIMIT = .002  |         | GUIDELINE = .300    | (A3) |
| MAR                   | .010                | .004    |                     |      |
|                       | .012                | .004    |                     |      |
| APR                   | .007                | .003    |                     |      |
| MAY                   | BDL                 | BDL     |                     |      |
| JUN                   | .009                | .005    |                     |      |
| JUL                   | .009                | .006    |                     |      |
| AUG                   | .087                | .006    |                     |      |
| SEP                   | .016                | BDL     |                     |      |
| OCT                   | .072                | BDL     |                     |      |
| NOV                   | .010                | BDL     |                     |      |
| DEC                   | .018                | .003    |                     |      |
| -----                 |                     |         |                     |      |
| MERCURY (UG/L )       | DET'N LIMIT = 0.010 |         | GUIDELINE = 1.000   | (A1) |
| MAR                   | .010                | BDL     |                     |      |
|                       | BDL                 | BDL     |                     |      |
| APR                   | .010                | BDL     |                     |      |
| MAY                   | .010                | .010    |                     |      |
| JUN                   | .020                | .010    |                     |      |
| JUL                   | .010                | .020    |                     |      |
| AUG                   | .020                | .050    |                     |      |
| SEP                   | .030                | .030    |                     |      |
| OCT                   | .020                | .020    |                     |      |
| NOV                   | .040                | .030    |                     |      |
| DEC                   | .040                | .030    |                     |      |
| -----                 |                     |         |                     |      |
| MANGANESE (MG/L )     | DET'N LIMIT = .001  |         | GUIDELINE = .050    | (A3) |
| MAR                   | .011                | .006    |                     |      |
|                       | .010                | .005    |                     |      |
| APR                   | .010                | .005    |                     |      |
| MAY                   | .009                | .005    |                     |      |
| JUN                   | .010                | .005    |                     |      |
| JUL                   | .011                | .006    |                     |      |
| AUG                   | .013                | .007    |                     |      |
| SEP                   | .010                | .005    |                     |      |
| OCT                   | .012                | .006    |                     |      |
| NOV                   | .012                | .006    |                     |      |
| DEC                   | .011                | .006    |                     |      |
| -----                 |                     |         |                     |      |
| MOLYBDENUM (MG/L )    | DET'N LIMIT = 0.001 |         | GUIDELINE = .50     | (H)  |

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM KITCHENER WELL SUPPLY K21, MANNHEIM RES 1987

## WATER TREATMENT PLANT

## DISTRIBUTION SYSTEM

RAW TREATED

|     | RAW  | TREATED |
|-----|------|---------|
| MAR | BDL  | BDL     |
|     | BDL  | BDL     |
| APR | BDL  | BDL     |
| MAY | BDL  | BDL     |
| JUN | BDL  | BDL     |
| JUL | BDL  | BDL     |
| AUG | BDL  | BDL     |
| SEP | BDL  | BDL     |
| OCT | .001 | BDL     |
| NOV | .001 | BDL     |
| DEC | BDL  | BDL     |

NICKEL (MG/L )

DET'N LIMIT = 0.001

GUIDELINE = .05 (F3)

|     | RAW  | TREATED |
|-----|------|---------|
| MAR | BDL  | BDL     |
|     | BDL  | BDL     |
| APR | BDL  | BDL     |
| MAY | BDL  | BDL     |
| JUN | BDL  | BDL     |
| JUL | BDL  | BDL     |
| AUG | BDL  | BDL     |
| SEP | BDL  | BDL     |
| OCT | .001 | .002    |
| NOV | .002 | .002    |
| DEC | .002 | .002    |

LEAD (MG/L )

DET'N LIMIT = 0.003

GUIDELINE = .050 (A1)

|     | RAW  | TREATED |
|-----|------|---------|
| MAR | BDL  | BDL     |
|     | .005 | BDL     |
| APR | BDL  | BDL     |
| MAY | BDL  | BDL     |
| JUN | BDL  | BDL     |
| JUL | BDL  | BDL     |
| AUG | BDL  | BDL     |
| SEP | .006 | .006    |
| OCT | BDL  | BDL     |
| NOV | BDL  | BDL     |
| DEC | BDL  | BDL     |

STRONTIUM (MG/L )

DET'N LIMIT = .001

GUIDELINE = 2.00 (H)

|     | RAW  | TREATED |
|-----|------|---------|
| MAR | .230 | .180    |
|     | .210 | .160    |
| APR | .190 | .150    |
| MAY | .210 | .170    |
| JUN | .220 | .170    |

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM KITCHENER WELL SUPPLY K21, MANNHEIM RES 1987

| WATER TREATMENT PLANT |                       | DISTRIBUTION SYSTEM |
|-----------------------|-----------------------|---------------------|
|                       | RAW                   | TREATED             |
| <hr/>                 |                       |                     |
| JUL                   | .220                  | .170                |
| AUG                   | .210                  | .170                |
| SEP                   | .210                  | .160                |
| OCT                   | .210                  | .160                |
| NOV                   | .200                  | .150                |
| DEC                   | .200                  | .150                |
| <hr/>                 |                       |                     |
| URANIUM (UG/L )       | DET'N LIMIT = .02     |                     |
|                       | GUIDELINE = 20. (A2)  |                     |
| MAR                   | .820                  | .840                |
|                       | .820                  | .850                |
| APR                   | .850                  | .930                |
| MAY                   | .790                  | .960                |
| JUN                   | .790                  | .810                |
| JUL                   | .890                  | .910                |
| AUG                   | .040                  | .020                |
| SEP                   | 1.020                 | 1.110               |
| OCT                   | 1.430                 | 1.580               |
| NOV                   | .910                  | .930                |
| DEC                   | 1.100                 | 1.100               |
| <hr/>                 |                       |                     |
| VANADIUM (MG/L )      | DET'N LIMIT = .001    |                     |
|                       | GUIDELINE = .10 (H)   |                     |
| MAR                   | BDL                   | BDL                 |
|                       | BDL                   | BDL                 |
| APR                   | BDL                   | BDL                 |
| MAY                   | BDL                   | BDL                 |
| JUN                   | BDL                   | BDL                 |
| JUL                   | BDL                   | BDL                 |
| AUG                   | BDL                   | BDL                 |
| SEP                   | BDL                   | BDL                 |
| OCT                   | BDL                   | BDL                 |
| NOV                   | .002                  | BDL                 |
| DEC                   | BDL                   | BDL                 |
| <hr/>                 |                       |                     |
| ZINC (MG/L )          | DET'N LIMIT = .001    |                     |
|                       | GUIDELINE = 5.00 (A3) |                     |
| MAR                   | .006                  | .004                |
|                       | .004                  | .003                |
| APR                   | .005                  | .003                |
| MAY                   | .008                  | .005                |
| JUN                   | .006                  | .006                |
| JUL                   | .004                  | .005                |
| AUG                   | .007                  | .007                |
| SEP                   | .011                  | .042                |
| OCT                   | .005                  | .004                |
| NOV                   | .005                  | .005                |

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM KITCHENER WELL SUPPLY K21, MANNHEIM RES 1987

## WATER TREATMENT PLANT

## DISTRIBUTION SYSTEM

RAW

TREATED

DEC

.006

.004



TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM KITCHENER WELL SUPPLY K21, MANNHEIM RES 1987

| WATER TREATMENT PLANT        |                     | DISTRIBUTION SYSTEM     |
|------------------------------|---------------------|-------------------------|
| RAW                          | TREATED             |                         |
| -----                        |                     |                         |
| CHLOROAROMATICS              |                     |                         |
| 1245 T-CHLOROBENZENE (NG/L ) | DET'N LIMIT = 1.000 | GUIDELINE = 38000. (D4) |
| MAR                          | BDL                 | BDL                     |
|                              | BDL                 | BDL                     |
| APR                          | BDL                 | BDL                     |
| MAY                          | BDL                 | 3.000 <T                |
| JUN                          | BDL                 | BDL                     |
| JUL                          | BDL                 | BDL                     |
| AUG                          | BDL                 | BDL                     |
| SEP                          | !SM                 | BDL                     |
| OCT                          | BDL                 | BDL                     |
| NOV                          | BDL                 | BDL                     |
| DEC                          | BDL                 | BDL                     |
| -----                        |                     |                         |
| HEXACHLOROETHANE (NG/L )     | DET'N LIMIT = 1.000 | GUIDELINE = 1900. (D4)  |
| MAR                          | BDL                 | BDL                     |
|                              | BDL                 | BDL                     |
| APR                          | BDL                 | BDL                     |
| MAY                          | BDL                 | 1.000 <T                |
| JUN                          | BDL                 | BDL                     |
| JUL                          | BDL                 | BDL                     |
| AUG                          | BDL                 | BDL                     |
| SEP                          | !SM                 | BDL                     |
| OCT                          | BDL                 | BDL                     |
| NOV                          | BDL                 | BDL                     |
| DEC                          | BDL                 | BDL                     |

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM KITCHENER WELL SUPPLY K21, MANNHEIM RES 1987

## WATER TREATMENT PLANT

## DISTRIBUTION SYSTEM

RAW TREATED

## PESTICIDES &amp; PCB

ALPHA BHC (NG/L )

DET'N LIMIT = 1.000

GUIDELINE = 700. (G)

|     |     |          |
|-----|-----|----------|
| MAR | BDL | BDL      |
|     | BDL | BDL      |
| APR | BDL | BDL      |
| MAY | BDL | BDL      |
| JUN | BDL | BDL      |
| JUL | BDL | 3.000 <T |
| AUG | BDL | BDL      |
| SEP | ISM | BDL      |
| OCT | BDL | BDL      |
| NOV | BDL | BDL      |
| DEC | BDL | BDL      |

LINDANE (NG/L )

DET'N LIMIT = 1.000

GUIDELINE = 4000.0 (A1)

|     |     |          |
|-----|-----|----------|
| MAR | BDL | BDL      |
|     | BDL | BDL      |
| APR | BDL | BDL      |
| MAY | BDL | BDL      |
| JUN | BDL | BDL      |
| JUL | BDL | 1.000 <T |
| AUG | BDL | BDL      |
| SEP | ISM | BDL      |
| OCT | BDL | BDL      |
| NOV | BDL | BDL      |
| DEC | BDL | BDL      |

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM KITCHENER WELL SUPPLY K21, MANNHEIM RES 1987

| WATER TREATMENT PLANT |                      | DISTRIBUTION SYSTEM     |
|-----------------------|----------------------|-------------------------|
| RAW                   | TREATED              |                         |
| -----                 |                      |                         |
| SPECIFIC PESTICIDES   |                      |                         |
| ATRAZINE (NG/L )      | DET'N LIMIT = 50.00  | GUIDELINE = 60000. (B3) |
| MAR                   | BDL                  | BDL                     |
|                       | BDL                  | BDL                     |
| APR                   | 100.000 <T           | BDL                     |
| MAY                   | BDL                  | BDL                     |
| JUN                   | BDL                  | BDL                     |
| JUL                   | !PE                  | !PE                     |
| AUG                   | BDL                  | BDL                     |
| SEP                   | BDL                  | BDL                     |
| OCT                   | BDL                  | BDL                     |
| NOV                   | BDL                  | BDL                     |
| DEC                   | BDL                  | BDL                     |
| -----                 |                      |                         |
| BLADEX (NG/L )        | DET'N LIMIT = 100.00 | GUIDELINE = 10000. (B3) |
| MAR                   | BDL                  | BDL                     |
|                       | 130.000 <T           | BDL                     |
| APR                   | BDL                  | BDL                     |
| MAY                   | BDL                  | BDL                     |
| JUN                   | BDL                  | BDL                     |
| JUL                   | !PE                  | !PE                     |
| AUG                   | BDL                  | BDL                     |
| SEP                   | BDL                  | BDL                     |
| OCT                   | BDL                  | BDL                     |
| NOV                   | BDL                  | BDL                     |
| DEC                   | BDL                  | BDL                     |
| -----                 |                      |                         |
| PROMETONE (NG/L )     | DET'N LIMIT = 50.00  | GUIDELINE = 52500. (D3) |
| MAR                   | BDL                  | BDL                     |
|                       | 210.000 <T           | BDL                     |
| APR                   | BDL                  | BDL                     |
| MAY                   | BDL                  | BDL                     |
| JUN                   | BDL                  | BDL                     |
| JUL                   | !PE                  | !PE                     |
| AUG                   | BDL                  | BDL                     |
| SEP                   | BDL                  | BDL                     |
| OCT                   | BDL                  | BDL                     |
| NOV                   | BDL                  | BDL                     |
| DEC                   | BDL                  | BDL                     |

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM KITCHENER WELL SUPPLY K21, MANNHEIM RES 1987

## WATER TREATMENT PLANT

## DISTRIBUTION SYSTEM

RAW

TREATED

## PHENOLICS

PHENOL (UG/L )

DET'N LIMIT = 0.2

GUIDELINE = 2.00 (A3)

|     |            |           |
|-----|------------|-----------|
| MAR | .200 <T    | !NR       |
|     | BDL        | .         |
| APR | 11.800 CIC | 6.200 CIC |
| MAY | .200 <T    | BDL       |
| JUN | .200 <T    | .200 <T   |
| JUL | .400 <T    | BDL       |
| AUG | BDL        | BDL       |
| SEP | BDL        | BDL       |
| OCT | BDL        | BDL       |
| NOV | BDL        | BDL       |
| DEC | BDL        | BDL       |

TABLE 3

DRINKING WATER SURVEILLANCE PROGRAM KITCHENER WELL SUPPLY K21, MANNHEIM RES SAMPLE DAY C 1987

## SAMPLE DAY CONDITIONS

## TREATMENT CHEMICAL DOSAGES (MG/L)

## PRE-CHLORINATION

## SODIUM HYPOCHLORITE

| DATE | RETENTION<br>TIME(HRS) | FLOW<br>(1000 M3) |
|------|------------------------|-------------------|
|------|------------------------|-------------------|

|        |    |      |       |
|--------|----|------|-------|
| MAR 23 | .5 | 21.9 | 01.01 |
| APR 22 | .3 | 37.4 | 01.07 |
| MAY 20 | .0 | 29.4 | 01.07 |
| JUN 23 | .5 | 29.5 | 00.97 |
| JUL 21 | .5 | 37.0 | 01.01 |
| AUG 18 | .4 | 34.5 | 01.01 |
| SEP 22 | .5 | 38.0 | 01.01 |
| OCT 21 | .5 | 43.9 | 01.01 |
| NOV 24 | .6 | 45.4 | 01.01 |
| DEC 10 | .6 | 47.8 | 01.14 |

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM KITCHENER WELL SUPPLY K21, MANNHEIM RES 1987

## WATER TREATMENT PLANT

## DISTRIBUTION SYSTEM

RAW TREATED

## VOLATILES

| TOLUENE (UG/L ) |          | DET'N LIMIT = 0 | GUIDELINE = 100.0 (G) |
|-----------------|----------|-----------------|-----------------------|
| MAR             | BDL      | BDL             |                       |
|                 | BDL      | BDL             |                       |
| APR             | BDL      | BDL             |                       |
| MAY             | BDL      | BDL             |                       |
| JUN             | BDL      | BDL             |                       |
| JUL             | BDL      | BDL             |                       |
| AUG             | BDL      | BDL             |                       |
| SEP             | BDL      | BDL             |                       |
| OCT             | BDL      | BDL             |                       |
| NOV             | .100 UCS | BDL             |                       |
| DEC             | BDL      | BDL             |                       |

| ETHYLBENZENE (UG/L ) |         | DET'N LIMIT = 0 | GUIDELINE = 3400. (D3) |
|----------------------|---------|-----------------|------------------------|
| MAR                  | BDL     | BDL             |                        |
|                      | BDL     | BDL             |                        |
| APR                  | BDL     | BDL             |                        |
| MAY                  | BDL     | BDL             |                        |
| JUN                  | BDL     | BDL             |                        |
| JUL                  | .150 <T | .150 <T         |                        |
| AUG                  | BDL     | .150 <T         |                        |
| SEP                  | .100 <T | BDL             |                        |
| OCT                  | BDL     | .100 <T         |                        |
| NOV                  | BDL     | BDL             |                        |
| DEC                  | BDL     | BDL             |                        |

| 1,1 DICHLOROETHYLENE (UG/L ) |          | DET'N LIMIT = 0 | GUIDELINE = 7.0 (D1) |
|------------------------------|----------|-----------------|----------------------|
| MAR                          | .000 APS | BDL             |                      |
|                              | BDL      | BDL             |                      |
| APR                          | BDL      | BDL             |                      |
| MAY                          | BDL      | BDL             |                      |
| JUN                          | BDL      | BDL             |                      |
| JUL                          | BDL      | BDL             |                      |
| AUG                          | BDL      | BDL             |                      |
| SEP                          | BDL      | BDL             |                      |
| OCT                          | BDL      | BDL             |                      |
| NOV                          | BDL      | BDL             |                      |
| DEC                          | BDL      | BDL             |                      |

| CHLOROFORM (UG/L ) |     | DET'N LIMIT = 0 | GUIDELINE = 350.0 (A1+) |
|--------------------|-----|-----------------|-------------------------|
| MAR                | BDL | BDL             |                         |
|                    | BDL | BDL             |                         |
| APR                | BDL | BDL             |                         |

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM KITCHENER WELL SUPPLY K21, MANNHEIM RES 1987

| WATER TREATMENT PLANT        |     | DISTRIBUTION SYSTEM     |
|------------------------------|-----|-------------------------|
|                              | RAW | TREATED                 |
| <hr/>                        |     |                         |
| MAY                          | BDL | .300 <T                 |
| JUN                          | BDL | BDL                     |
| JUL                          | BDL | BDL                     |
| AUG                          | BDL | BDL                     |
| SEP                          | BDL | .100 <T                 |
| OCT                          | BDL | BDL                     |
| NOV                          | BDL | .200 <T                 |
| DEC                          | BDL | .200 <T                 |
| <hr/>                        |     |                         |
| DICHLOROBROMOMETHANE (UG/L ) |     | DET'N LIMIT = 0         |
|                              |     | GUIDELINE = 350.0 (A1+) |
| MAR                          | BDL | BDL                     |
|                              | BDL | BDL                     |
| APR                          | BDL | BDL                     |
| MAY                          | BDL | .500 <T                 |
| JUN                          | BDL | .500                    |
| JUL                          | BDL | BDL                     |
| AUG                          | BDL | BDL                     |
| SEP                          | BDL | .300 <T                 |
| OCT                          | BDL | .800 <T                 |
| NOV                          | BDL | .500                    |
| DEC                          | BDL | .300 <T                 |
| <hr/>                        |     |                         |
| CHLORODIBROMOMETHANE (UG/L ) |     | DET'N LIMIT = 0         |
|                              |     | GUIDELINE = 350.0 (A1+) |
| MAR                          | BDL | 1.000                   |
|                              | BDL | 1.000                   |
| APR                          | BDL | 1.000 <T                |
| MAY                          | BDL | 1.000                   |
| JUN                          | BDL | .800 <T                 |
| JUL                          | BDL | .400 <T                 |
| AUG                          | BDL | BDL                     |
| SEP                          | BDL | .600 <T                 |
| OCT                          | BDL | .700 <T                 |
| NOV                          | BDL | 1.000                   |
| DEC                          | BDL | .500 <T                 |
| <hr/>                        |     |                         |
| BROMOFORM (UG/L )            |     | DET'N LIMIT = 0         |
|                              |     | GUIDELINE = 350.0 (A1+) |
| MAR                          | BDL | BDL                     |
|                              | BDL | BDL                     |
| APR                          | BDL | 1.000 <T                |
| MAY                          | BDL | .200 <T                 |
| JUN                          | BDL | 1.200 <T                |
| JUL                          | BDL | BDL                     |
| AUG                          | BDL | BDL                     |
| SEP                          | BDL | .400 <T                 |

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM KITCHENER WELL SUPPLY K21, MANNHEIM RES 1987

## WATER TREATMENT PLANT

## DISTRIBUTION SYSTEM

RAW TREATED

|     |     |         |
|-----|-----|---------|
| OCT | BDL | .200 <T |
| NOV | BDL | .800 <T |
| DEC | BDL | BDL     |

1,4 DICHLOROBENZENE (UG/L )

DET'N LIMIT = 0

GUIDELINE = 75.0 (D1)

|     |         |     |
|-----|---------|-----|
| MAR | BDL     | BDL |
|     | BDL     | BDL |
| APR | BDL     | BDL |
| MAY | BDL     | BDL |
| JUN | BDL     | BDL |
| JUL | BDL     | BDL |
| AUG | BDL     | BDL |
| SEP | .100 <T | BDL |
| OCT | BDL     | BDL |
| NOV | BDL     | BDL |
| DEC | BDL     | BDL |

TOTL TRIHALOMETHANES (UG/L )

DET'N LIMIT = 0

GUIDELINE = 350.0 (A1)

|     |     |       |
|-----|-----|-------|
| MAR | BDL | 1.000 |
|     | BDL | 1.000 |
| APR | BDL | 2.000 |
| MAY | BDL | 2.000 |
| JUN | BDL | 2.500 |
| JUL | BDL | .400  |
| AUG | BDL | BDL   |
| SEP | BDL | 1.400 |
| OCT | BDL | 1.700 |
| NOV | BDL | 2.500 |
| DEC | BDL | 1.000 |



TABLE 5

## DRINKING WATER SURVEILLANCE PROGRAM STRANGE STREET RESERVOIR, KITCHENER 1987

## WATER TREATMENT PLANT

## DISTRIBUTION SYSTEM

## TREATED

| BACTERIOLOGICAL                  |     | DET'N LIMIT = 0 | GUIDELINE = 500/ML (A1) |
|----------------------------------|-----|-----------------|-------------------------|
| STANDRD PLATE CNT MF (CT/ML )    |     |                 |                         |
| MAR                              | 0   |                 |                         |
|                                  | 0   |                 |                         |
| APR                              | 2   |                 |                         |
| MAY                              | !LA |                 |                         |
| JUN                              | 2   |                 |                         |
| JUL                              | 48  |                 |                         |
| AUG                              | 6   |                 |                         |
| OCT                              | 0   |                 |                         |
| P/A BOTTLE (0=ABSENT )           |     | DET'N LIMIT = 0 | GUIDELINE = 0 (A1*)     |
|                                  |     |                 |                         |
| MAR                              | 0   |                 |                         |
|                                  | 0   |                 |                         |
| APR                              | 0   |                 |                         |
| MAY                              | 0   |                 |                         |
| JUN                              | 0   |                 |                         |
| JUL                              | 0   |                 |                         |
| AUG                              | !LA |                 |                         |
| OCT                              | 0   |                 |                         |
| TOTAL COLIFORM MF (CT/100ML )    |     | DET'N LIMIT = 0 | GUIDELINE = 5/100ML(A1) |
|                                  |     |                 |                         |
| MAR                              | 0   |                 |                         |
|                                  | 0   |                 |                         |
| APR                              | 0   |                 |                         |
| MAY                              | 0   |                 |                         |
| JUN                              | 0   |                 |                         |
| JUL                              | 0   |                 |                         |
| AUG                              | 0   |                 |                         |
| OCT                              | 0   |                 |                         |
| T COLIFORM BCKGRD MF (CT/100ML ) |     | DET'N LIMIT = 0 | GUIDELINE = N/A         |
|                                  |     |                 |                         |
| MAR                              | 0   |                 |                         |
|                                  | 0   |                 |                         |
| APR                              | 0   |                 |                         |
| MAY                              | 0   |                 |                         |
| JUN                              | 0   |                 |                         |
| JUL                              | 0   |                 |                         |
| AUG                              | 2   |                 |                         |
| OCT                              | 3   |                 |                         |

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM STRANGE STREET RESERVOIR, KITCHENER 1987

## WATER TREATMENT PLANT

## DISTRIBUTION SYSTEM

## TREATED

-----  
CHEMISTRY (FLD)

FLD CHLORINE (COMB) (MG/L )

DET'N LIMIT = N/A

GUIDELINE = N/A

|     |      |
|-----|------|
| MAR | .100 |
| APR | .100 |
| MAY | .100 |
| JUL | .100 |
| OCT | .100 |

-----  
FLD CHLORINE FREE (MG/L )

DET'N LIMIT = N/A

GUIDELINE = N/A

|     |      |
|-----|------|
| OCT | .100 |
|-----|------|

-----  
TOTAL CHLORINE (MG/L )

DET'N LIMIT = N/A

GUIDELINE = N/A

|     |      |
|-----|------|
| MAR | .100 |
| APR | .100 |
| MAY | .100 |
| JUN | .100 |
| JUL | .100 |
| AUG | .100 |
| OCT | .200 |

-----  
FLD PH (DMSNLESS )

DET'N LIMIT = N/A

GUIDELINE = 6.5-8.5 (A4)

|     |       |
|-----|-------|
| MAR | 7.400 |
|     | 7.300 |
| APR | 7.300 |
| MAY | 7.300 |
| JUN | 7.300 |
| JUL | 7.300 |
| AUG | 7.300 |
| OCT | 7.300 |

-----  
TEMPERATURE (DEG.C )

DET'N LIMIT = N/A

GUIDELINE = N/A

|     |        |
|-----|--------|
| MAR | 10.000 |
|     | 9.000  |
| APR | 9.000  |
| MAY | 9.500  |
| JUN | 10.000 |
| JUL | 11.000 |
| AUG | 10.000 |
| OCT | 8.000  |

TABLE 5

## DRINKING WATER SURVEILLANCE PROGRAM STRANGE STREET RESERVOIR, KITCHENER 1987

| WATER TREATMENT PLANT   |          | DISTRIBUTION SYSTEM |                         |
|-------------------------|----------|---------------------|-------------------------|
| TREATED                 |          |                     |                         |
| -----                   |          |                     |                         |
| CHEMISTRY (LAB)         |          |                     |                         |
| ALKALINITY (MG/L )      |          | DET'N LIMIT = .200  | GUIDELINE = 30-500 (A4) |
| MAR                     | 318.300  |                     |                         |
|                         | 322.500  |                     |                         |
| APR                     | 316.900  |                     |                         |
| MAY                     | 319.100  |                     |                         |
| JUN                     | 317.900  |                     |                         |
| JUL                     | 325.700  |                     |                         |
| AUG                     | 330.100  |                     |                         |
| OCT                     | 315.500  |                     |                         |
| -----                   |          |                     |                         |
| CALCIUM (MG/L )         |          | DET'N LIMIT = .100  | GUIDELINE = 100. (F2)   |
| MAR                     | 122.000  |                     |                         |
|                         | 116.000  |                     |                         |
| APR                     | 128.000  |                     |                         |
| MAY                     | 128.000  |                     |                         |
| JUN                     | 128.000  |                     |                         |
| JUL                     | 126.000  |                     |                         |
| AUG                     | 125.000  |                     |                         |
| OCT                     | 125.000  |                     |                         |
| -----                   |          |                     |                         |
| CHLORIDE (MG/L )        |          | DET'N LIMIT = .200  | GUIDELINE = 250.0 (A3)  |
| MAR                     | 70.000   |                     |                         |
|                         | 71.500   |                     |                         |
| APR                     | 71.500   |                     |                         |
| MAY                     | 83.500   |                     |                         |
| JUN                     | 89.500   |                     |                         |
| JUL                     | 86.000   |                     |                         |
| AUG                     | 85.500   |                     |                         |
| OCT                     | 77.800   |                     |                         |
| -----                   |          |                     |                         |
| COLOUR (TCU )           |          | DET'N LIMIT = .5    | GUIDELINE = 5.0 (A3)    |
| MAR                     | 2.500 <T |                     |                         |
|                         | 2.000 <T |                     |                         |
| APR                     | 1.500 <T |                     |                         |
| MAY                     | 1.000 <T |                     |                         |
| JUN                     | BDL      |                     |                         |
| JUL                     | 2.000 <T |                     |                         |
| AUG                     | 1.500 <T |                     |                         |
| OCT                     | 1.500 <T |                     |                         |
| -----                   |          |                     |                         |
| CONDUCTIVITY (UMHO/CM ) |          | DET'N LIMIT = 1     | GUIDELINE = 400. (F2)   |
| MAR                     | 882      |                     |                         |

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM STRANGE STREET RESERVOIR, KITCHENER 1987

## WATER TREATMENT PLANT

## DISTRIBUTION SYSTEM

## TREATED

|     |      |
|-----|------|
| MAR | 961  |
| APR | 968  |
| MAY | 1009 |
| JUN | 1006 |
| JUL | 1016 |
| AUG | 1017 |
| OCT | 944  |

## FLUORIDE (MG/L )

DET'N LIMIT = .01

GUIDELINE = 2.400 (A1)

|     |       |
|-----|-------|
| MAR | .090  |
|     | .090  |
| APR | .100  |
| MAY | .080  |
| JUN | .130  |
| JUL | .090  |
| AUG | 1.000 |
| OCT | .100  |

## HARDNESS (MG/L )

DET'N LIMIT = .500

GUIDELINE = 80-100 (A4)

|     |         |
|-----|---------|
| MAR | 442.500 |
|     | 436.500 |
| APR | 459.500 |
| MAY | 467.000 |
| JUN | 473.000 |
| JUL | 467.000 |
| AUG | 460.000 |
| OCT | 454.000 |

## MAGNESIUM (MG/L )

DET'N LIMIT = .050

GUIDELINE = 30. (F2)

|     |        |
|-----|--------|
| MAR | 33.800 |
|     | 35.400 |
| APR | 34.100 |
| MAY | 35.800 |
| JUN | 37.100 |
| JUL | 37.000 |
| AUG | 36.000 |
| OCT | 34.400 |

## SODIUM (MG/L )

DET'N LIMIT = .200

GUIDELINE = 200. (C3)

|     |        |
|-----|--------|
| MAR | 31.100 |
|     | 30.800 |
| APR | 30.600 |
| MAY | 37.200 |

TABLE 5

## DRINKING WATER SURVEILLANCE PROGRAM STRANGE STREET RESERVOIR, KITCHENER 1987

| WATER TREATMENT PLANT     |         | DISTRIBUTION SYSTEM |                         |
|---------------------------|---------|---------------------|-------------------------|
| TREATED                   |         |                     |                         |
| <hr/>                     |         |                     |                         |
| JUN                       | 39.000  |                     |                         |
| JUL                       | 39.200  |                     |                         |
| AUG                       | 37.800  |                     |                         |
| OCT                       | 36.800  |                     |                         |
| <hr/>                     |         |                     |                         |
| AMMONIUM TOTAL (MG/L)     | )       | DET'N LIMIT = 0.002 | GUIDELINE = .05 (F2)    |
| MAR                       | BDL     |                     |                         |
|                           | .008 <T |                     |                         |
| APR                       | BDL     |                     |                         |
| MAY                       | BDL     |                     |                         |
| JUN                       | .010    |                     |                         |
| JUL                       | .002 <T |                     |                         |
| AUG                       | .014    |                     |                         |
| OCT                       | .018    |                     |                         |
| <hr/>                     |         |                     |                         |
| NITRITE (MG/L)            | )       | DET'N LIMIT = 0.001 | GUIDELINE = 1.000 (A1)  |
| MAR                       | .001 <T |                     |                         |
|                           | .001 <T |                     |                         |
| APR                       | BDL     |                     |                         |
| MAY                       | BDL     |                     |                         |
| JUN                       | .004 <T |                     |                         |
| JUL                       | .004 <T |                     |                         |
| AUG                       | .021    |                     |                         |
| OCT                       | BDL     |                     |                         |
| <hr/>                     |         |                     |                         |
| TOTAL NITRATES (MG/L)     | )       | DET'N LIMIT = .020  | GUIDELINE = 10.000 (A1) |
| MAR                       | .325    |                     |                         |
|                           | .350    |                     |                         |
| APR                       | .365    |                     |                         |
| MAY                       | .430    |                     |                         |
| JUN                       | .470    |                     |                         |
| JUL                       | .440    |                     |                         |
| AUG                       | .385    |                     |                         |
| OCT                       | .525    |                     |                         |
| <hr/>                     |         |                     |                         |
| NITROGEN TOT KJELD (MG/L) | )       | DET'N LIMIT = .020  | GUIDELINE = N/A         |
| MAR                       | .110    |                     |                         |
|                           | .140    |                     |                         |
| APR                       | .070 <T |                     |                         |
| MAY                       | .050 <T |                     |                         |
| JUN                       | .100    |                     |                         |
| JUL                       | .080 <T |                     |                         |
| AUG                       | .110    |                     |                         |

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM STRANGE STREET RESERVOIR, KITCHENER 1987

## WATER TREATMENT PLANT

## DISTRIBUTION SYSTEM

## TREATED

-----

|     |      |
|-----|------|
| OCT | .100 |
|-----|------|

-----

PH (DMSNLESS )

DET'N LIMIT = N/A

GUIDELINE = 6.5-8.5(A4)

|     |       |
|-----|-------|
| MAR | 7.920 |
|     | 7.860 |
| APR | 8.000 |
| MAY | 8.190 |
| JUN | 8.200 |
| JUL | 7.930 |
| AUG | 7.940 |
| OCT | 8.010 |

-----

PHOSPHORUS FIL REACT (MG/L )

DET'N LIMIT = .5UG/L

GUIDELINE = N/A

|     |         |
|-----|---------|
| MAR | .002 <T |
|     | .001 <T |
| APR | .002 <T |
| MAY | .001 <T |
| JUN | .001 <T |
| JUL | .001 <T |
| AUG | .001 <T |
| OCT | .001 <T |

-----

PHOSPHORUS TTL-UNFIL (MG/L )

DET'N LIMIT = .002

GUIDELINE = .40 (F2)

|     |         |
|-----|---------|
| MAR | .003 <T |
|     | BDL     |
| APR | .008 <T |
| MAY | BDL     |
| JUN | .003 <T |
| JUL | .002 <T |
| AUG | .002 <T |
| OCT | BDL     |

-----

RESIDUE (TOTAL) (MG/L )

DET'N LIMIT = 1.

GUIDELINE = 500. (A3)

|     |     |
|-----|-----|
| MAR | 681 |
|     | 567 |
| APR | 568 |
| MAY | 633 |
| JUN | 811 |
| JUL | 671 |
| AUG | 705 |
| OCT | 554 |

-----

TURBIDITY (FTU )

DET'N LIMIT = .02

GUIDELINE = 1.00 (A1)

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM STRANGE STREET RESERVOIR, KITCHENER 1987

WATER TREATMENT PLANT

DISTRIBUTION SYSTEM

TREATED

|     |         |
|-----|---------|
| MAR | .300    |
|     | .210    |
| APR | .220    |
| MAY | .130    |
| JUN | .150 <T |
| JUL | .230    |
| AUG | .190    |
| OCT | .410    |

TABLE 5

## DRINKING WATER SURVEILLANCE PROGRAM STRANGE STREET RESERVOIR, KITCHENER 1987

## WATER TREATMENT PLANT

## DISTRIBUTION SYSTEM

## TREATED

| METALS           |         |                     |                   |      |
|------------------|---------|---------------------|-------------------|------|
| ALUMINUM (MG/L ) |         | DET'N LIMIT = .004  | GUIDELINE = .10   | (A4) |
| MAR              | BDL     |                     |                   |      |
|                  | .027    |                     |                   |      |
| APR              | .053    |                     |                   |      |
| MAY              | BDL     |                     |                   |      |
| JUN              | BDL     |                     |                   |      |
| JUL              | BDL     |                     |                   |      |
| AUG              | BDL     |                     |                   |      |
| OCT              | BDL     |                     |                   |      |
| BARIUM (MG/L )   |         | DET'N LIMIT = 0.001 | GUIDELINE = 1.000 | (A1) |
| MAR              | .110    |                     |                   |      |
|                  | .110    |                     |                   |      |
| APR              | .095    |                     |                   |      |
| MAY              | .110    |                     |                   |      |
| JUN              | .100    |                     |                   |      |
| JUL              | .110    |                     |                   |      |
| AUG              | .120    |                     |                   |      |
| OCT              | .096    |                     |                   |      |
| BORON (MG/L )    |         | DET'N LIMIT = 0.01  | GUIDELINE = 5.000 | (A1) |
| MAR              | .050    |                     |                   |      |
|                  | .050    |                     |                   |      |
| APR              | .050    |                     |                   |      |
| MAY              | .060    |                     |                   |      |
| JUN              | .030    |                     |                   |      |
| JUL              | .040 <T |                     |                   |      |
| AUG              | .040 <T |                     |                   |      |
| OCT              | .040 <T |                     |                   |      |
| COBALT (MG/L )   |         | DET'N LIMIT = 0.001 | GUIDELINE = 1.0   | (H)  |
| MAR              | BDL     |                     |                   |      |
|                  | BDL     |                     |                   |      |
| APR              | BDL     |                     |                   |      |
| MAY              | .001    |                     |                   |      |
| JUN              | .001    |                     |                   |      |
| JUL              | .002    |                     |                   |      |
| AUG              | .002    |                     |                   |      |
| OCT              | .002    |                     |                   |      |
| CHROMIUM (MG/L ) |         | DET'N LIMIT = 0.001 | GUIDELINE = .05   | (A1) |
| MAR              | BDL     |                     |                   |      |



TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM STRANGE STREET RESERVOIR, KITCHENER 1987

## WATER TREATMENT PLANT

## DISTRIBUTION SYSTEM

## TREATED

---

|     |      |
|-----|------|
| MAR | BDL  |
| APR | BDL  |
| MAY | BDL  |
| JUN | BDL  |
| JUL | BDL  |
| AUG | .001 |
| OCT | .005 |

---

## COPPER (MG/L )

DET'N LIMIT = .001

GUIDELINE = 1.0 (A3)

|     |      |
|-----|------|
| MAR | .004 |
|     | .003 |
| APR | .002 |
| MAY | .002 |
| JUN | .003 |
| JUL | .003 |
| AUG | .003 |
| OCT | .005 |

---

## IRON (MG/L )

DET'N LIMIT = .002

GUIDELINE = .300 (A3)

|     |      |
|-----|------|
| MAR | .140 |
|     | .130 |
| APR | .120 |
| MAY | .110 |
| JUN | .120 |
| JUL | .140 |
| AUG | .210 |
| OCT | .089 |

---

## MERCURY (UG/L )

DET'N LIMIT = 0.010

GUIDELINE = 1.000 (A1)

|     |      |
|-----|------|
| MAR | BDL  |
|     | BDL  |
| APR | .010 |
| MAY | .010 |
| JUN | .020 |
| JUL | .010 |
| AUG | .010 |
| OCT | .020 |

---

## MANGANESE (MG/L )

DET'N LIMIT = .001

GUIDELINE = .050 (A3)

|     |      |
|-----|------|
| MAR | .053 |
|     | .051 |
| APR | .049 |
| MAY | .090 |

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM STRANGE STREET RESERVOIR, KITCHENER 1987

## WATER TREATMENT PLANT

## DISTRIBUTION SYSTEM

## TREATED

|     |      |
|-----|------|
| JUN | .100 |
| JUL | .120 |
| AUG | .130 |
| OCT | .110 |

NICKEL (MG/L )

DET'N LIMIT = 0.001

GUIDELINE = .05 (F3)

|     |      |
|-----|------|
| MAR | BDL  |
|     | BDL  |
| APR | BDL  |
| MAY | BDL  |
| JUN | BDL  |
| JUL | BDL  |
| AUG | .002 |
| OCT | .002 |

STRONTIUM (MG/L )

DET'N LIMIT = .001

GUIDELINE = 2.00 (H)

|     |      |
|-----|------|
| MAR | .340 |
|     | .330 |
| APR | .270 |
| MAY | .440 |
| JUN | .480 |
| JUL | .560 |
| AUG | .520 |
| OCT | .539 |

URANIUM (UG/L )

DET'N LIMIT = .02

GUIDELINE = 20. (A2)

|     |       |
|-----|-------|
| MAR | 1.480 |
|     | 1.200 |
| APR | 1.400 |
| MAY | 1.400 |
| JUN | 1.200 |
| JUL | 1.290 |
| AUG | .060  |
| OCT | 1.680 |

ZINC (MG/L )

DET'N LIMIT = .001

GUIDELINE = 5.00 (A3)

|     |      |
|-----|------|
| MAR | .023 |
|     | .016 |
| APR | .016 |
| MAY | .021 |
| JUN | .021 |
| JUL | .022 |
| AUG | .018 |

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM STRANGE STREET RESERVOIR, KITCHENER 1987

WATER TREATMENT PLANT

DISTRIBUTION SYSTEM

TREATED

OCT

.018

TABLE 5

## DRINKING WATER SURVEILLANCE PROGRAM STRANGE STREET RESERVOIR, KITCHENER 1987

WATER TREATMENT PLANT

DISTRIBUTION SYSTEM

TREATED

## CHLOROAROMATICS

124 TRICHLOROBENZENE (NG/L )

DET'M LIMIT = 5.000

GUIDELINE = 10000. (1)

|     |          |
|-----|----------|
| MAR | BDL      |
|     | BDL      |
| APR | 5.000 <T |
| MAY | BDL      |
| JUN | BDL      |
| JUL | BDL      |
| AUG | BDL      |
| OCT | BDL      |

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM STRANGE STREET RESERVOIR, KITCHENER 1987

| WATER TREATMENT PLANT        |        | DISTRIBUTION SYSTEM |                        |
|------------------------------|--------|---------------------|------------------------|
| TREATED                      |        |                     |                        |
| -----                        |        |                     |                        |
| PAH                          |        |                     |                        |
| FLUORANTHENE (NG/L )         |        | DET'N LIMIT = 0     | GUIDELINE = 42000 (D4) |
| AUG                          | 20.000 |                     |                        |
| OCT                          | 30.000 |                     |                        |
| -----                        |        |                     |                        |
| PYRENE (NG/L )               |        | DET'N LIMIT = 0     | GUIDELINE = N/A        |
| AUG                          | 40.000 |                     |                        |
| OCT                          | 40.000 |                     |                        |
| -----                        |        |                     |                        |
| BENZO(K) FLUORANTHEN (NG/L ) |        | DET'N LIMIT = N/A   | GUIDELINE = N/A        |
| AUG                          | 1.000  |                     |                        |
| OCT                          | 1.000  |                     |                        |

TABLE 5

## DRINKING WATER SURVEILLANCE PROGRAM STRANGE STREET RESERVOIR, KITCHENER 1987

WATER TREATMENT PLANT

DISTRIBUTION SYSTEM

TREATED

| -----          |           |                   |                       |
|----------------|-----------|-------------------|-----------------------|
| PHENOLICS      |           |                   |                       |
| PHENOL (UG/L ) |           | DET'M LIMIT = 0.2 | GUIDELINE = 2.00 (A3) |
| MAR            | BDL       |                   |                       |
|                | BDL       |                   |                       |
| APR            | 3.200 CIC |                   |                       |
| MAY            | BDL       |                   |                       |
| JUN            | BDL       |                   |                       |
| JUL            | BDL       |                   |                       |
| AUG            | BDL       |                   |                       |
| OCT            | BDL       |                   |                       |

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM STRANGE STREET RESERVOIR, KITCHENER 1987

| WATER TREATMENT PLANT        |          | DISTRIBUTION SYSTEM |                         |
|------------------------------|----------|---------------------|-------------------------|
| TREATED                      |          |                     |                         |
| -----                        |          |                     |                         |
| VOLATILES                    |          |                     |                         |
| 1,1 DICHLOROETHYLENE (UG/L ) |          | DET'N LIMIT = 0     | GUIDELINE = 7.0 (D1)    |
| MAR                          | BDL      |                     |                         |
|                              | BDL      |                     |                         |
| APR                          | BDL      |                     |                         |
| MAY                          | BDL      |                     |                         |
| JUN                          | BDL      |                     |                         |
| JUL                          | .300 <T  |                     |                         |
| AUG                          | .300 <T  |                     |                         |
| OCT                          | .400 <T  |                     |                         |
| -----                        |          |                     |                         |
| 1,1 DICHLOROETHANE (UG/L )   |          | DET'N LIMIT = 0     | GUIDELINE = N/A         |
| MAR                          | BDL      |                     |                         |
|                              | BDL      |                     |                         |
| APR                          | BDL      |                     |                         |
| MAY                          | BDL      |                     |                         |
| JUN                          | BDL      |                     |                         |
| JUL                          | BDL      |                     |                         |
| AUG                          | BDL      |                     |                         |
| OCT                          | .200 <T  |                     |                         |
| -----                        |          |                     |                         |
| CHLOROFORM (UG/L )           |          | DET'N LIMIT = 0     | GUIDELINE = 350.0 (A1+) |
| MAR                          | 1.000    |                     |                         |
|                              | BDL      |                     |                         |
| APR                          | 1.000 <T |                     |                         |
| MAY                          | .900 <T  |                     |                         |
| JUN                          | .300 <T  |                     |                         |
| JUL                          | 1.000    |                     |                         |
| AUG                          | .600 <T  |                     |                         |
| OCT                          | .400 <T  |                     |                         |
| -----                        |          |                     |                         |
| 111, TRICHLOROETHANE (UG/L ) |          | DET'N LIMIT = 0     | GUIDELINE = 200. (D1)   |
| MAR                          | 2.000    |                     |                         |
|                              | 2.000    |                     |                         |
| APR                          | 2.000    |                     |                         |
| MAY                          | 2.000    |                     |                         |
| JUN                          | 2.000    |                     |                         |
| JUL                          | 2.000    |                     |                         |
| AUG                          | 2.000    |                     |                         |
| OCT                          | 4.800    |                     |                         |
| -----                        |          |                     |                         |
| TRICHLOROETHYLENE (UG/L )    |          | DET'N LIMIT = 0     | GUIDELINE = 5.0 (D1)    |
| MAR                          | BDL      |                     |                         |

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM STRANGE STREET RESERVOIR, KITCHENER 1987

## WATER TREATMENT PLANT

## DISTRIBUTION SYSTEM

## TREATED

|     |         |
|-----|---------|
| MAR | BDL     |
| APR | BDL     |
| MAY | .300 <T |
| JUN | .400 <T |
| JUL | .400 <T |
| AUG | .400 <T |
| OCT | .500 <T |

DICHLOROBROMOMETHANE (UG/L )

DET'N LIMIT = 0

GUIDELINE = 350.0 (A1+)

|     |         |
|-----|---------|
| MAR | 1.000   |
|     | 1.000   |
| APR | 1.000   |
| MAY | 1.000   |
| JUN | .500    |
| JUL | .800 <T |
| AUG | .700 <T |
| OCT | .500 <T |

CHLORODIBROMOMETHANE (UG/L )

DET'N LIMIT = 0

GUIDELINE = 350.0 (A1+)

|     |         |
|-----|---------|
| MAR | 2.000   |
|     | 2.000   |
| APR | 2.000   |
| MAY | 3.000   |
| JUN | .900 <T |
| JUL | 1.000   |
| AUG | 1.000   |
| OCT | .400 <T |

T-CHLOROETHYLENE (UG/L )

DET'N LIMIT = 0

GUIDELINE = 10.0 (C2)

|     |         |
|-----|---------|
| MAR | BDL     |
|     | BDL     |
| APR | BDL     |
| MAY | BDL     |
| JUN | BDL     |
| JUL | BDL     |
| AUG | BDL     |
| OCT | .300 <T |

BROMOFORM (UG/L )

DET'N LIMIT = 0

GUIDELINE = 350.0 (A1+)

|     |          |
|-----|----------|
| MAR | 1.000    |
|     | 2.000    |
| APR | 2.000 <T |
| MAY | 2.000    |



TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM STRANGE STREET RESERVOIR, KITCHENER 1987

WATER TREATMENT PLANT

DISTRIBUTION SYSTEM

TREATED

|     |         |
|-----|---------|
| JUN | .800 <T |
| JUL | .200 <T |
| AUG | .200 <T |
| OCT | BDL     |

TOTL TRIHALOMETHANES (UG/L )

DET'N LIMIT = 0

GUIDELINE = 350.0 (A1)

|     |       |
|-----|-------|
| MAR | 5.000 |
|     | 5.000 |
| APR | 6.000 |
| MAY | 6.900 |
| JUN | 2.500 |
| JUL | 3.000 |
| AUG | 2.500 |
| OCT | 1.300 |

TABLE 6

DRINKING WATER SURVEILLANCE PROGRAM K 70 RECHARGE WELL, KITCHENER 1987

## COUNT OF PARAMETERS NOT FOUND ABOVE THE DETECTION LIMIT

| SCAN<br>----     | PARAMETER<br>-----   | ANALYSED<br>----- | DETECTION LIMIT<br>----- | GUIDELINE<br>----- |
|------------------|----------------------|-------------------|--------------------------|--------------------|
| CHEMISTRY (LAB)  | CYANIDE              | 20                | 0.001                    | .200 (A1) MG/L     |
| METALS           | ARSENIC              | 20                | 0.001                    | .050 (A1) MG/L     |
|                  | BERYLLIUM            | 20                | 0.001                    | .0002 (H) MG/L     |
|                  | CYANIDE              | 20                | 0.001                    | .200 (A1) MG/L     |
|                  | CADMIUM              | 20                | 0.300                    | 5.000 (A1) UG/L    |
|                  | LEAD                 | 20                | 0.003                    | .050 (A1) MG/L     |
|                  | SELENIUM             | 20                | 0.001                    | .010 (A1) MG/L     |
|                  | VANADIUM             | 20                | .001                     | .10 (H) MG/L       |
| CHLOROAROMATICS  | HEXACHLOROBUTADIENE  | 20                | 1.000                    | 450. (D4) NG/L     |
|                  | 123 TRICHLOROBENZENE | 20                | 5.000                    | 10000. (I) NG/L    |
|                  | 1234 T-CHLOROBENZENE | 20                | 1.000                    | 10000. (I) NG/L    |
|                  | 1235 T-CHLOROBENZENE | 20                | 1.000                    | 10000. (I) NG/L    |
|                  | 124 TRICHLOROBENZENE | 20                | 5.000                    | 10000. (I) NG/L    |
|                  | 1245 T-CHLOROBENZENE | 20                | 1.000                    | 38000. (D4) NG/L   |
|                  | 135 TRICHLOROBENZENE | 20                | 5.000                    | 10000. (D4) NG/L   |
|                  | OCTACHLOROSTYRENE    | 20                | 1.000                    | N/A NG/L           |
|                  | PENTACHLOROBENZENE   | 20                | 1.000                    | 74000. (D4) NG/L   |
|                  | 236 TRICHLOROTOLUENE | 20                | 5.000                    | N/A NG/L           |
|                  | 245 TRICHLOROTOLUENE | 20                | 5.000                    | N/A NG/L           |
|                  | 26A TRICHLOROTOLUENE | 20                | 5.000                    | N/A NG/L           |
| CHLOROPHENOLS    | 234 TRICHLOROPHENOL  | 4                 | 50.                      | N/A NG/L           |
|                  | 2345 T-CHLOROPHENOL  | 4                 | 50.                      | N/A NG/L           |
|                  | 2356 T-CHLOROPHENOL  | 4                 | 50.                      | N/A NG/L           |
|                  | 245-TRICHLOROPHENOL  | 4                 | 50.                      | 2600000(D4) NG/L   |
|                  | 246-TRICHLOROPHENOL  | 4                 | 50.                      | 10000. (C1) NG/L   |
|                  | PENTACHLOROPHENOL    | 4                 | 50.                      | 10000. (C1) NG/L   |
| PAH              | PHENANTHRENE         | 8                 | 0                        | N/A NG/L           |
|                  | ANTHRACENE           | 8                 | 0                        | N/A NG/L           |
|                  | FLUORANTHENE         | 8                 | 0                        | 42000 (D4) NG/L    |
|                  | PYRENE               | 8                 | 0                        | N/A NG/L           |
|                  | BENZO(A)ANTHRACENE   | 8                 | 0                        | N/A NG/L           |
|                  | CHRYSENE             | 8                 | 0                        | N/A NG/L           |
|                  | DIMETH. BENZ(A)ANTHR | 8                 | 0                        | N/A NG/L           |
|                  | BENZO(E)PYRENE       | 8                 | 0                        | N/A NG/L           |
|                  | BENZO(J) FLUORANTHEN | 8                 | N/A                      | N/A NG/L           |
|                  | BENZO(B) FLUORANTHEN | 8                 | 0                        | N/A NG/L           |
|                  | PERYLENE             | 8                 | 0                        | N/A NG/L           |
|                  | BENZO(K) FLUORANTHEN | 8                 | N/A                      | N/A NG/L           |
|                  | BENZO (A) PYRENE     | 8                 | 0                        | 10 (B1) NG/L       |
|                  | BENZO(G,H,I) PERYLEN | 8                 | 0                        | N/A NG/L           |
|                  | DIBENZO(A,H) ANTHRAC | 8                 | 0                        | N/A NG/L           |
|                  | INDENO(1,2,3-C,D) PY | 8                 | 0                        | N/A NG/L           |
|                  | BENZO(B) CHRYSENE    | 8                 | 0                        | N/A NG/L           |
|                  | ANTHANTHRENE         | 8                 | N/A                      | N/A NG/L           |
|                  | CORONENE             | 8                 | 0                        | N/A NG/L           |
| PESTICIDES & PCB | ALDRIN               | 20                | 1.000                    | 700.0 (A1) NG/L    |

TABLE 6

DRINKING WATER SURVEILLANCE PROGRAM K 70 RECHARGE WELL, KITCHENER 1987

## COUNT OF PARAMETERS NOT FOUND ABOVE THE DETECTION LIMIT

| SCAN                | PARAMETER            | ANALYSED | DETECTION LIMIT | GUIDELINE         |
|---------------------|----------------------|----------|-----------------|-------------------|
| ----                | -----                | -----    | -----           | -----             |
| PESTICIDES & PCB    | ALPHA BHC            | 20       | 1.000           | 700. (G) NG/L     |
|                     | BETA BHC             | 20       | 1.000           | 300. (G) NG/L     |
|                     | LINDANE              | 20       | 1.000           | 4000.0 (A1) NG/L  |
|                     | ALPHA CHLORDANE      | 20       | 2.000           | 7000.0 (A1) NG/L  |
|                     | GAMMA CHLORDANE      | 20       | 2.000           | 7000.0 (A1) NG/L  |
|                     | DIELDRIN             | 20       | 2.000           | 700.0 (A1) NG/L   |
|                     | METHOXYCHLOR         | 20       | 5.000           | 100000. (A1) NG/L |
|                     | THIODAN I            | 20       | 2.000           | 74000. (D4) NG/L  |
|                     | THIODAN II           | 20       | 4.000           | 74000. (D4) NG/L  |
|                     | ENDRIN               | 20       | 4.000           | 200.0 (A1) NG/L   |
|                     | THIODAN SULPHATE     | 20       | 4.000           | N/A NG/L          |
|                     | HEPTACHLOR EPOXIDE   | 20       | 1.000           | 3000.0 (A1) NG/L  |
|                     | HEPTACHLOR           | 20       | 1.000           | 3000.0 (A1) NG/L  |
|                     | MIREX                | 20       | 5.000           | N/A NG/L          |
|                     | OXYCHLORDANE         | 20       | 2.000           | N/A NG/L          |
|                     | OPDDT                | 20       | 5.000           | 30000. (A1) NG/L  |
|                     | PCB                  | 20       | 20.000          | 3000. (A2) NG/L   |
|                     | PP-DDD               | 20       | 5.000           | N/A NG/L          |
|                     | PPDDE                | 20       | 1.000           | 30000. (A1) NG/L  |
|                     | PPDDT                | 20       | 5.000           | 30000. (A1) NG/L  |
|                     | ATRATONE             | 20       | 50.             | N/A NG/L          |
|                     | ALACHLOR             | 20       | 500.            | 35000. (D2) NG/L  |
|                     | ETHYLENE DIBROMIDE   | 20       | 0               | 50.0 (G) UG/L     |
|                     | HCB                  | 20       | 1.000           | 10.0 (C1) NG/L    |
| SPECIFIC PESTICIDES | TOXAPHENE            | 20       | N/A             | 5000. (A1) NG/L   |
|                     | AMETRYNE             | 20       | 50.00           | 300000. (D3) NG/L |
|                     | BLADEx               | 20       | 100.00          | 10000. (B3) NG/L  |
|                     | PROMETONE            | 20       | 50.00           | 52500. (D3) NG/L  |
|                     | PROPazine            | 20       | 50.00           | 16000. (D2) NG/L  |
|                     | PROMETRYNE           | 20       | 50.00           | 1000. (B3) NG/L   |
|                     | SENCOR               | 20       | 100.00          | 80000. (B2) NG/L  |
|                     | SIMAZINE             | 20       | 50.00           | 10000. (B3) NG/L  |
|                     | 2,4,5-T              | 4        | 50.00           | 35000. (D2) NG/L  |
|                     | 2,4-D                | 4        | 100.00          | 100000. (A1) NG/L |
|                     | 24DCHLRPHENOXYBUTYRC | 4        | 200.00          | 18000. (B3) NG/L  |
|                     | 2,4-DP               | 4        | 100.00          | N/A NG/L          |
|                     | DICAMBA              | 4        | 100.00          | 87000. (B3) NG/L  |
|                     | PICHLORAM            | 4        | 100.00          | 2450000 (D3) NG/L |
|                     | SILVEX               | 4        | 50.00           | 10000. (A1) NG/L  |
|                     | DIAZINON             | 4        | 20.             | 14000. (A1) NG/L  |
|                     | DICHLOROVOS          | 4        | 20.             | N/A NG/L          |
|                     | DURSBAN              | 4        | 20.             | N/A NG/L          |
|                     | ETHION               | 4        | 20.             | 35000. (G) NG/L   |
|                     | GUTHION              | 4        | N/A             | N/A NG/L          |
|                     | MALATHION            | 4        | 20.             | 160000. (G) NG/L  |
|                     | MEVINPHOS            | 4        | 20.             | N/A NG/L          |
|                     | METHYL PARATHION     | 4        | 50.             | 7000. (B3) NG/L   |
|                     | METHYLTRITHION       | 4        | 20.             | N/A NG/L          |
|                     | PARATHION            | 4        | 20.             | 35000. (B1) NG/L  |
|                     | PHORATE              | 4        | 20.             | 35.0 (D2) NG/L    |
|                     | RELDAN               | 4        | 20.             | N/A NG/L          |

TABLE 6

DRINKING WATER SURVEILLANCE PROGRAM K 70 RECHARGE WELL, KITCHENER 1987

## COUNT OF PARAMETERS NOT FOUND ABOVE THE DETECTION LIMIT

| SCAN<br>----        | PARAMETER<br>-----     | ANALYSED<br>----- | DETECTION LIMIT<br>----- | GUIDELINE<br>----- |
|---------------------|------------------------|-------------------|--------------------------|--------------------|
| SPECIFIC PESTICIDES | RONNEL                 | 4                 | 20.                      | N/A NG/L           |
|                     | AMINOCARB              | 4                 | N/A                      | N/A NG/L           |
|                     | BENOMYL                | 4                 | N/A                      | N/A NG/L           |
|                     | BUX                    | 4                 | 2000.                    | N/A NG/L           |
|                     | CARBOFURAN             | 4                 | 2000.                    | 18000. (D3) NG/L   |
|                     | CIPC                   | 4                 | 2000.                    | 350000. (G) NG/L   |
|                     | DIALATE                | 4                 | 2000.                    | 30000. (H) NG/L    |
|                     | EPTAM                  | 4                 | 2000.                    | N/A NG/L           |
|                     | IPC                    | 4                 | 2000.                    | N/A NG/L           |
|                     | PROPOXUR               | 4                 | 2000.                    | 90000. (G) NG/L    |
|                     | SEVIN                  | 4                 | 200.                     | 70000. (A1) NG/L   |
|                     | SUTAN                  | 4                 | 2000.                    | 245000. (D3) NG/L  |
|                     | METOLACHLOR            | 20                | 500.                     | 50000. (B3) NG/L   |
| VOLATILES           | O-XYLENE               | 20                | 0                        | 620. (G) UG/L      |
|                     | 1,1 DICHLOROETHYLENE   | 20                | 0                        | 7.0 (D1) UG/L      |
|                     | DICHLOROMETHANE        | 20                | 0                        | 1750. (D3) UG/L    |
|                     | 1,1,2 DICHLOROETHYLENE | 20                | 0                        | 350. (D3) UG/L     |
|                     | 1,1 DICHLOROETHANE     | 20                | 0                        | N/A UG/L           |
|                     | 111, TRICHLOROETHANE   | 20                | 0                        | 200. (D1) UG/L     |
|                     | 1,2 DICHLOROETHANE     | 20                | 0                        | 5.0 (D1) UG/L      |
|                     | CARBON TETRACHLORIDE   | 20                | 0                        | 5.0 (D1) UG/L      |
|                     | 1,2 DICHLOROPROPANE    | 20                | 0                        | 10.0 (G) UG/L      |
|                     | TRICHLOROETHYLENE      | 20                | 0                        | 5.0 (D1) UG/L      |
|                     | 112 TRICHLOROETHANE    | 20                | 0                        | .60 (D4) UG/L      |
|                     | T-CHLOROETHYLENE       | 20                | 0                        | 10.0 (C2) UG/L     |
|                     | BROMOFORM              | 20                | 0                        | 350.0 (A1+) UG/L   |
|                     | 1122 T-CHLOROETHANE    | 20                | 0                        | 0.17 (D4) UG/L     |
|                     | CHLOROBENZENE          | 20                | 0                        | 1510. (D3) UG/L    |
|                     | 1,4 DICHLOROBENZENE    | 20                | 0                        | 75.0 (D1) UG/L     |
|                     | 1,3 DICHLOROBENZENE    | 20                | 0                        | 130. (G) UG/L      |
|                     | 1,2 DICHLOROBENZENE    | 20                | 0                        | 130. (G) UG/L      |
|                     | TRIFLUOROCHLOROTOLUE   | 20                | 0                        | N/A UG/L           |
|                     | ETHYLENE DIBROMIDE     | 20                | 0                        | 50.0 (G) UG/L      |

TABLE 6

DRINKING WATER SURVEILLANCE PROGRAM KITCHENER WELL SUPPLY K21, MANNHEIM RES 1987

## COUNT OF PARAMETERS NOT FOUND ABOVE THE DETECTION LIMIT

| SCAN<br>----     | PARAMETER<br>-----   | ANALYSED<br>----- | DETECTION LIMIT<br>----- | GUIDELINE<br>----- |
|------------------|----------------------|-------------------|--------------------------|--------------------|
| CHEMISTRY (LAB)  | CYANIDE              | 22                | 0.001                    | .200 (A1) MG/L     |
| METALS           | ARSENIC              | 22                | 0.001                    | .050 (A1) MG/L     |
|                  | BERYLLIUM            | 22                | 0.001                    | .0002 (H) MG/L     |
|                  | CYANIDE              | 22                | 0.001                    | .200 (A1) MG/L     |
|                  | SELENIUM             | 22                | 0.001                    | .010 (A1) MG/L     |
| CHLOROAROMATICS  | HEXACHLOROBUTADIENE  | 22                | 1.000                    | 450. (D4) NG/L     |
|                  | 123 TRICHLOROBENZENE | 22                | 5.000                    | 10000. (I) NG/L    |
|                  | 1234 T-CHLOROBENZENE | 22                | 1.000                    | 10000. (I) NG/L    |
|                  | 1235 T-CHLOROBENZENE | 22                | 1.000                    | 10000. (I) NG/L    |
|                  | 124 TRICHLOROBENZENE | 22                | 5.000                    | 10000. (I) NG/L    |
|                  | 135 TRICHLOROBENZENE | 22                | 5.000                    | 10000. (D4) NG/L   |
|                  | OCTACHLOROSTYRENE    | 22                | 1.000                    | N/A NG/L           |
|                  | PENTACHLOROBENZENE   | 22                | 1.000                    | 74000. (D4) NG/L   |
|                  | 236 TRICHLOROTOLUENE | 22                | 5.000                    | N/A NG/L           |
|                  | 245 TRICHLOROTOLUENE | 22                | 5.000                    | N/A NG/L           |
|                  | 26A TRICHLOROTOLUENE | 22                | 5.000                    | N/A NG/L           |
| CHLOROPHENOLS    | 234 TRICHLOROPHENOL  | 4                 | 50.                      | N/A NG/L           |
|                  | 2345 T-CHLOROPHENOL  | 4                 | 50.                      | N/A NG/L           |
|                  | 2356 T-CHLOROPHENOL  | 4                 | 50.                      | N/A NG/L           |
|                  | 245-TRICHLOROPHENOL  | 4                 | 50.                      | 2600000 (D4) NG/L  |
|                  | 246-TRICHLOROPHENOL  | 4                 | 50.                      | 10000. (C1) NG/L   |
|                  | PENTACHLOROPHENOL    | 4                 | 50.                      | 10000. (C1) NG/L   |
| PAH              | PHENANTHRENE         | 8                 | 0                        | N/A NG/L           |
|                  | ANTHRACENE           | 8                 | 0                        | N/A NG/L           |
|                  | FLUORANTHENE         | 8                 | 0                        | 42000 (D4) NG/L    |
|                  | PYRENE               | 8                 | 0                        | N/A NG/L           |
|                  | BENZO(A)ANTHRACENE   | 8                 | 0                        | N/A NG/L           |
|                  | CHRYSENE             | 8                 | 0                        | N/A NG/L           |
|                  | DIMETH. BENZ(A)ANTHR | 8                 | 0                        | N/A NG/L           |
|                  | BENZO(E)PYRENE       | 8                 | 0                        | N/A NG/L           |
|                  | BENZO(J) FLUORANTHEN | 8                 | N/A                      | N/A NG/L           |
|                  | BENZO(B) FLUORANTHEN | 8                 | 0                        | N/A NG/L           |
|                  | PERYLENE             | 8                 | 0                        | N/A NG/L           |
|                  | BENZO(K) FLUORANTHEN | 8                 | N/A                      | N/A NG/L           |
|                  | BENZO (A) PYRENE     | 8                 | 0                        | 10 (B1) NG/L       |
|                  | BENZO(G,H,I) PERYLEN | 8                 | 0                        | N/A NG/L           |
|                  | DIBENZO(A,H) ANTHRAC | 8                 | 0                        | N/A NG/L           |
|                  | INDENO(1,2,3-C,D) PY | 8                 | 0                        | N/A NG/L           |
|                  | BENZO(B) CHRYSENE    | 8                 | 0                        | N/A NG/L           |
|                  | ANTHANTHRENE         | 8                 | N/A                      | N/A NG/L           |
|                  | CORONENE             | 8                 | 0                        | N/A NG/L           |
| PESTICIDES & PCB | ALDRIN               | 22                | 1.000                    | 700.0 (A1) NG/L    |
|                  | BETA BHC             | 22                | 1.000                    | 300. (G) NG/L      |
|                  | ALPHA CHLORDANE      | 22                | 2.000                    | 7000.0 (A1) NG/L   |

TABLE 6

DRINKING WATER SURVEILLANCE PROGRAM KITCHENER WELL SUPPLY K21, MANNHEIM RES 1987

## COUNT OF PARAMETERS NOT FOUND ABOVE THE DETECTION LIMIT

| SCAN                | PARAMETER            | ANALYSED | DETECTION LIMIT | GUIDELINE         |
|---------------------|----------------------|----------|-----------------|-------------------|
| -----               | -----                | -----    | -----           | -----             |
| PESTICIDES & PCB    | GAMMA CHLORDANE      | 22       | 2.000           | 7000.0 (A1) NG/L  |
|                     | DIELDRIN             | 22       | 2.000           | 700.0 (A1) NG/L   |
|                     | METHOXYCHLOR         | 22       | 5.000           | 100000. (A1) NG/L |
|                     | THIODAN I            | 22       | 2.000           | 74000. (D4) NG/L  |
|                     | THIODAN II           | 22       | 4.000           | 74000. (D4) NG/L  |
|                     | ENDRIN               | 22       | 4.000           | 200.0 (A1) NG/L   |
|                     | THIODAN SULPHATE     | 22       | 4.000           | N/A NG/L          |
|                     | HEPTACHLOR EPOXIDE   | 22       | 1.000           | 3000.0 (A1) NG/L  |
|                     | HEPTACHLOR           | 22       | 1.000           | 3000.0 (A1) NG/L  |
|                     | MIREX                | 22       | 5.000           | N/A NG/L          |
|                     | OXYCHLORDANE         | 22       | 2.000           | N/A NG/L          |
|                     | OPDDT                | 22       | 5.000           | 30000. (A1) NG/L  |
|                     | PCB                  | 22       | 20.000          | 3000. (A2) NG/L   |
|                     | PP-DDD               | 22       | 5.000           | N/A NG/L          |
|                     | PPDDE                | 22       | 1.000           | 30000. (A1) NG/L  |
|                     | PPDDT                | 22       | 5.000           | 30000. (A1) NG/L  |
|                     | ATRATONE             | 22       | 50.             | N/A NG/L          |
|                     | ALACHLOR             | 22       | 500.            | 35000. (D2) NG/L  |
|                     | ETHYLENE DIBROMIDE   | 22       | 0               | 50.0 (G) UG/L     |
|                     | HCB                  | 22       | 1.000           | 10.0 (C1) NG/L    |
| SPECIFIC PESTICIDES | TOXAPHENE            | 22       | N/A             | 5000. (A1) NG/L   |
|                     | AMETRYNE             | 22       | 50.00           | 300000. (D3) NG/L |
|                     | PROPazine            | 22       | 50.00           | 16000. (D2) NG/L  |
|                     | PROMETRYNE           | 22       | 50.00           | 1000. (B3) NG/L   |
|                     | SENCOR               | 22       | 100.00          | 80000. (B2) NG/L  |
|                     | SIMAZINE             | 22       | 50.00           | 10000. (B3) NG/L  |
|                     | 2,4,5-T              | 4        | 50.00           | 35000. (D2) NG/L  |
|                     | 2,4-D                | 4        | 100.00          | 100000. (A1) NG/L |
|                     | 24DCHLRPHENOXYBUTYRC | 4        | 200.00          | 18000. (B3) NG/L  |
|                     | 2,4-DP               | 4        | 100.00          | N/A NG/L          |
|                     | DICAMBA              | 4        | 100.00          | 87000. (B3) NG/L  |
|                     | PICHLORAM            | 4        | 100.00          | 2450000 (D3) NG/L |
|                     | SILVEX               | 4        | 50.00           | 10000. (A1) NG/L  |
|                     | DIAZINON             | 4        | 20.             | 14000. (A1) NG/L  |
|                     | DICHLOROVOS          | 4        | 20.             | N/A NG/L          |
|                     | DURSBAN              | 4        | 20.             | N/A NG/L          |
|                     | ETHION               | 4        | 20.             | 35000. (G) NG/L   |
|                     | GUTHION              | 4        | N/A             | N/A NG/L          |
|                     | MALATHION            | 4        | 20.             | 160000. (G) NG/L  |
|                     | MEVINPHOS            | 4        | 20.             | N/A NG/L          |
|                     | METHYL PARATHION     | 4        | 50.             | 7000. (B3) NG/L   |
|                     | METHYLTRITHION       | 4        | 20.             | N/A NG/L          |
|                     | PARATHION            | 4        | 20.             | 35000. (B1) NG/L  |
|                     | PHORATE              | 4        | 20.             | 35.0 (D2) NG/L    |
|                     | RELDAN               | 4        | 20.             | N/A NG/L          |
|                     | RONNEL               | 4        | 20.             | N/A NG/L          |
|                     | AMINOCARB            | 4        | N/A             | N/A NG/L          |
|                     | BENOMYL              | 4        | N/A             | N/A NG/L          |
|                     | BUX                  | 4        | 2000.           | N/A NG/L          |
|                     | CARBOFURAN           | 4        | 2000.           | 18000. (D3) NG/L  |
|                     | CIPC                 | 4        | 2000.           | 350000. (G) NG/L  |

TABLE 6

DRINKING WATER SURVEILLANCE PROGRAM KITCHENER WELL SUPPLY K21, MANNHEIM RES 1987

## COUNT OF PARAMETERS NOT FOUND ABOVE THE DETECTION LIMIT

| SCAN<br>----        | PARAMETER<br>-----   | ANALYSED<br>----- | DETECTION LIMIT<br>----- | GUIDELINE<br>----- |
|---------------------|----------------------|-------------------|--------------------------|--------------------|
| SPECIFIC PESTICIDES | DIALATE              | 4                 | 2000.                    | 30000. (H) NG/L    |
|                     | EPTAM                | 4                 | 2000.                    | N/A NG/L           |
|                     | IPC                  | 4                 | 2000.                    | N/A NG/L           |
|                     | PROPOXUR             | 4                 | 2000.                    | 90000. (G) NG/L    |
|                     | SEVIN                | 4                 | 200.                     | 70000. (A1) NG/L   |
|                     | SUTAN                | 4                 | 2000.                    | 245000. (D3) NG/L  |
|                     | METOLACHLOR          | 22                | 500.                     | 50000. (B3) NG/L   |
| VOLATILES           | BENZENE              | 22                | 0                        | 5.0 (D1) UG/L      |
|                     | P-XYLENE             | 22                | 0                        | 620. (G) UG/L      |
|                     | M-XYLENE             | 22                | 0                        | 620. (G) UG/L      |
|                     | O-XYLENE             | 22                | 0                        | 620. (G) UG/L      |
|                     | DICHLOROMETHANE      | 22                | 0                        | 1750. (D3) UG/L    |
|                     | T1,2DICHLOROETHYLENE | 22                | 0                        | 350. (D3) UG/L     |
|                     | 1,1 DICHLOROETHANE   | 22                | 0                        | N/A UG/L           |
|                     | 111, TRICHLOROETHANE | 22                | 0                        | 200. (D1) UG/L     |
|                     | 1,2 DICHLOROETHANE   | 22                | 0                        | 5.0 (D1) UG/L      |
|                     | CARBON TETRACHLORIDE | 22                | 0                        | 5.0 (D1) UG/L      |
|                     | 1,2 DICHLOROPROPANE  | 22                | 0                        | 10.0 (G) UG/L      |
|                     | TRICHLOROETHYLENE    | 22                | 0                        | 5.0 (D1) UG/L      |
|                     | 112 TRICHLOROETHANE  | 22                | 0                        | .60 (D4) UG/L      |
|                     | T-CHLOROETHYLENE     | 22                | 0                        | 10.0 (C2) UG/L     |
|                     | 1122 T-CHLOROETHANE  | 22                | 0                        | 0.17 (D4) UG/L     |
|                     | CHLOROBENZENE        | 22                | 0                        | 1510. (D3) UG/L    |
|                     | 1,3 DICHLOROBENZENE  | 22                | 0                        | 130. (G) UG/L      |
|                     | 1,2 DICHLOROBENZENE  | 22                | 0                        | 130. (G) UG/L      |
|                     | TRIFLUOROCHLOROTOLUE | 22                | 0                        | N/A UG/L           |
|                     | ETHYLENE DIBROMIDE   | 22                | 0                        | 50.0 (G) UG/L      |

TABLE 6

DRINKING WATER SURVEILLANCE PROGRAM STRANGE STREET RESERVOIR, KITCHENER 1987

## COUNT OF PARAMETERS NOT FOUND ABOVE THE DETECTION LIMIT

| SCAN             | PARAMETER            | ANALYSED | DETECTION LIMIT | GUIDELINE         |
|------------------|----------------------|----------|-----------------|-------------------|
| ----             | -----                | -----    | -----           | -----             |
| CHEMISTRY (LAB)  | CYANIDE              | 8        | 0.001           | .200 (A1) MG/L    |
| METALS           | ARSENIC              | 8        | 0.001           | .050 (A1) MG/L    |
|                  | BERYLLIUM            | 8        | 0.001           | .0002 (H) MG/L    |
|                  | CYANIDE              | 8        | 0.001           | .200 (A1) MG/L    |
|                  | CADMIUM              | 8        | 0.300           | 5.000 (A1) UG/L   |
|                  | MOLYBDENUM           | 8        | 0.001           | .50 (H) MG/L      |
|                  | LEAD                 | 8        | 0.003           | .050 (A1) MG/L    |
|                  | SELENIUM             | 8        | 0.001           | .010 (A1) MG/L    |
|                  | VANADIUM             | 8        | .001            | .10 (H) MG/L      |
| CHLOROAROMATICS  | HEXACHLOROBUTADIENE  | 8        | 1.000           | 450. (D4) NG/L    |
|                  | 123 TRICHLOROBENZENE | 8        | 5.000           | 10000. (I) NG/L   |
|                  | 1234 T-CHLOROBENZENE | 8        | 1.000           | 10000. (I) NG/L   |
|                  | 1235 T-CHLOROBENZENE | 8        | 1.000           | 10000. (I) NG/L   |
|                  | 1245 T-CHLOROBENZENE | 8        | 1.000           | 38000. (D4) NG/L  |
|                  | 135 TRICHLOROBENZENE | 8        | 5.000           | 10000. (D4) NG/L  |
|                  | HEXACHLOROETHANE     | 8        | 1.000           | 1900. (D4) NG/L   |
|                  | OCTACHLOROSTYRENE    | 8        | 1.000           | N/A NG/L          |
|                  | PENTACHLOROBENZENE   | 8        | 1.000           | 74000. (D4) NG/L  |
|                  | 236 TRICHLOROTOLUENE | 8        | 5.000           | N/A NG/L          |
|                  | 245 TRICHLOROTOLUENE | 8        | 5.000           | N/A NG/L          |
|                  | 26A TRICHLOROTOLUENE | 8        | 5.000           | N/A NG/L          |
| CHLOROPHENOLS    | 234 TRICHLOROPHENOL  | 1        | 50.             | N/A NG/L          |
|                  | 2345 T-CHLOROPHENOL  | 1        | 50.             | N/A NG/L          |
|                  | 2356 T-CHLOROPHENOL  | 1        | 50.             | N/A NG/L          |
|                  | 245-TRICHLOROPHENOL  | 1        | 50.             | 2600000 (D4) NG/L |
|                  | 246-TRICHLOROPHENOL  | 1        | 50.             | 10000. (C1) NG/L  |
|                  | PENTACHLOROPHENOL    | 1        | 50.             | 10000. (C1) NG/L  |
| PAH              | PHENANTHRENE         | 2        | 0               | N/A NG/L          |
|                  | ANTHRACENE           | 2        | 0               | N/A NG/L          |
|                  | BENZO(A)ANTHRACENE   | 2        | 0               | N/A NG/L          |
|                  | CHRYSENE             | 2        | 0               | N/A NG/L          |
|                  | DIMETH. BENZ(A)ANTHR | 2        | 0               | N/A NG/L          |
|                  | BENZO(E)PYRENE       | 2        | 0               | N/A NG/L          |
|                  | BENZO(J) FLUORANTHEN | 2        | N/A             | N/A NG/L          |
|                  | BENZO(B) FLUORANTHEN | 2        | 0               | N/A NG/L          |
|                  | PERYLENE             | 2        | 0               | N/A NG/L          |
|                  | BENZO (A) PYRENE     | 2        | 0               | 10 (B1) NG/L      |
|                  | BENZO(G,H,I) PERYLEN | 2        | 0               | N/A NG/L          |
|                  | DIBENZO(A,H) ANTHRAC | 2        | 0               | N/A NG/L          |
|                  | INDENO(1,2,3-C,D) PY | 2        | 0               | N/A NG/L          |
|                  | BENZO(B) CHRYSENE    | 2        | 0               | N/A NG/L          |
|                  | ANTHANTHRENE         | 2        | N/A             | N/A NG/L          |
|                  | CORONENE             | 2        | 0               | N/A NG/L          |
| PESTICIDES & PCB | ALDRIN               | 8        | 1.000           | 700.0 (A1) NG/L   |
|                  | ALPHA BHC            | 8        | 1.000           | 700. (G) NG/L     |
|                  | BETA BHC             | 8        | 1.000           | 300. (G) NG/L     |



TABLE 6

DRINKING WATER SURVEILLANCE PROGRAM STRANGE STREET RESERVOIR, KITCHENER 1987

## COUNT OF PARAMETERS NOT FOUND ABOVE THE DETECTION LIMIT

| SCAN                | PARAMETER            | ANALYSED | DETECTION LIMIT | GUIDELINE         |
|---------------------|----------------------|----------|-----------------|-------------------|
| ----                | -----                | -----    | -----           | -----             |
| PESTICIDES & PCB    | LINDANE              | 8        | 1.000           | 4000.0 (A1) NG/L  |
|                     | ALPHA CHLORDANE      | 8        | 2.000           | 7000.0 (A1) NG/L  |
|                     | GAMMA CHLORDANE      | 8        | 2.000           | 7000.0 (A1) NG/L  |
|                     | DIELDRIN             | 8        | 2.000           | 700.0 (A1) NG/L   |
|                     | METHOXYCHLOR         | 8        | 5.000           | 100000. (A1) NG/L |
|                     | THIODAN I            | 8        | 2.000           | 74000. (D4) NG/L  |
|                     | THIODAN II           | 8        | 4.000           | 74000. (D4) NG/L  |
|                     | ENDRIN               | 8        | 4.000           | 200.0 (A1) NG/L   |
|                     | THIODAN SULPHATE     | 8        | 4.000           | N/A NG/L          |
|                     | HEPTACHLOR EPOXIDE   | 8        | 1.000           | 3000.0 (A1) NG/L  |
|                     | HEPTACHLOR           | 8        | 1.000           | 3000.0 (A1) NG/L  |
|                     | MIREX                | 8        | 5.000           | N/A NG/L          |
|                     | OXYCHLORDANE         | 8        | 2.000           | N/A NG/L          |
|                     | OPDDT                | 8        | 5.000           | 30000. (A1) NG/L  |
|                     | PCB                  | 8        | 20.000          | 3000. (A2) NG/L   |
|                     | PP-DDD               | 8        | 5.000           | N/A NG/L          |
|                     | PPDDE                | 8        | 1.000           | 30000. (A1) NG/L  |
|                     | PPDDT                | 8        | 5.000           | 30000. (A1) NG/L  |
|                     | ATRATONE             | 8        | 50.             | N/A NG/L          |
|                     | ALACHLOR             | 8        | 500.            | 35000. (D2) NG/L  |
|                     | ETHYLENE DIBROMIDE   | 8        | 0               | 50.0 (G) UG/L     |
|                     | HCB                  | 8        | 1.000           | 10.0 (C1) NG/L    |
| SPECIFIC PESTICIDES | TOXAPHENE            | 8        | N/A             | 5000. (A1) NG/L   |
|                     | AMETRYNE             | 8        | 50.00           | 300000. (D3) NG/L |
|                     | ATRAZINE             | 8        | 50.00           | 60000. (B3) NG/L  |
|                     | BLADEx               | 8        | 100.00          | 10000. (B3) NG/L  |
|                     | PROMETONE            | 8        | 50.00           | 52500. (D3) NG/L  |
|                     | PROPazine            | 8        | 50.00           | 16000. (D2) NG/L  |
|                     | PROMETRYNE           | 8        | 50.00           | 1000. (B3) NG/L   |
|                     | SENCOR               | 8        | 100.00          | 80000. (B2) NG/L  |
|                     | SIMAZINE             | 8        | 50.00           | 10000. (B3) NG/L  |
|                     | 2,4,5-T              | 1        | 50.00           | 35000. (D2) NG/L  |
|                     | 2,4-D                | 1        | 100.00          | 100000. (A1) NG/L |
|                     | 24DCHLRPHENOXYBUTYRC | 1        | 200.00          | 18000. (B3) NG/L  |
|                     | 2,4-DP               | 1        | 100.00          | N/A NG/L          |
|                     | DICAMBA              | 1        | 100.00          | 87000. (B3) NG/L  |
|                     | PICHLORAM            | 1        | 100.00          | 2450000 (D3) NG/L |
|                     | SILVEX               | 1        | 50.00           | 10000. (A1) NG/L  |
|                     | DIAZINON             | 1        | 20.             | 14000. (A1) NG/L  |
|                     | DICHLOROVOS          | 1        | 20.             | N/A NG/L          |
|                     | DURSBAN              | 1        | 20.             | N/A NG/L          |
|                     | ETHION               | 1        | 20.             | 35000. (G) NG/L   |
|                     | GUTHION              | 1        | N/A             | N/A NG/L          |
|                     | MALATHION            | 1        | 20.             | 160000. (G) NG/L  |
|                     | MEVINPHOS            | 1        | 20.             | N/A NG/L          |
|                     | METHYL PARATHION     | 1        | 50.             | 7000. (B3) NG/L   |
|                     | METHYLTRITHION       | 1        | 20.             | N/A NG/L          |
|                     | PARATHION            | 1        | 20.             | 35000. (B1) NG/L  |
|                     | PHORATE              | 1        | 20.             | 35.0 (D2) NG/L    |
|                     | RELDAN               | 1        | 20.             | N/A NG/L          |
|                     | RONNEL               | 1        | 20.             | N/A NG/L          |

TABLE 6

DRINKING WATER SURVEILLANCE PROGRAM STRANGE STREET RESERVOIR, KITCHENER 1987

## COUNT OF PARAMETERS NOT FOUND ABOVE THE DETECTION LIMIT

| SCAN                | PARAMETER                 | ANALYSED | DETECTION LIMIT | GUIDELINE    |      |
|---------------------|---------------------------|----------|-----------------|--------------|------|
| ----                | -----                     | -----    | -----           | -----        |      |
| SPECIFIC PESTICIDES | AMINOCARB                 | 1        | N/A             | N/A          | NG/L |
|                     | BENOMYL                   | 1        | N/A             | N/A          | NG/L |
|                     | BUX                       | 1        | 2000.           | N/A          | NG/L |
|                     | CARBOFURAN                | 1        | 2000.           | 18000. (D3)  | NG/L |
|                     | CIPC                      | 1        | 2000.           | 350000. (G)  | NG/L |
|                     | DIALATE                   | 1        | 2000.           | 30000. (H)   | NG/L |
|                     | EPTAM                     | 1        | 2000.           | N/A          | NG/L |
|                     | IPC                       | 1        | 2000.           | N/A          | NG/L |
|                     | PROPOXUR                  | 1        | 2000.           | 90000. (G)   | NG/L |
|                     | SEVIN                     | 1        | 200.            | 70000. (A1)  | NG/L |
|                     | SUTAN                     | 1        | 2000.           | 245000. (D3) | NG/L |
|                     | METOLACHLOR               | 8        | 500.            | 50000. (B3)  | NG/L |
| VOLATILES           | BENZENE                   | 8        | 0               | 5.0 (D1)     | UG/L |
|                     | TOLUENE                   | 8        | 0               | 100.0 (G)    | UG/L |
|                     | ETHYLBENZENE              | 8        | 0               | 3400. (D3)   | UG/L |
|                     | P-XYLENE                  | 8        | 0               | 620. (G)     | UG/L |
|                     | M-XYLENE                  | 8        | 0               | 620. (G)     | UG/L |
|                     | O-XYLENE                  | 8        | 0               | 620. (G)     | UG/L |
|                     | DICHLOROMETHANE           | 8        | 0               | 1750. (D3)   | UG/L |
|                     | 1,1,2-DICHLOROETHYLENE    | 8        | 0               | 350. (D3)    | UG/L |
|                     | 1,2-DICHLOROETHANE        | 8        | 0               | 5.0 (D1)     | UG/L |
|                     | CARBON TETRACHLORIDE      | 8        | 0               | 5.0 (D1)     | UG/L |
|                     | 1,2-DICHLOROPROPANE       | 8        | 0               | 10.0 (G)     | UG/L |
|                     | 1,1,2-TRICHLOROETHANE     | 8        | 0               | .60 (D4)     | UG/L |
|                     | 1,1,2,2-TETRACHLOROETHANE | 8        | 0               | 0.17 (D4)    | UG/L |
|                     | CHLOROBENZENE             | 8        | 0               | 1510. (D3)   | UG/L |
|                     | 1,4-DICHLOROBENZENE       | 8        | 0               | 75.0 (D1)    | UG/L |
|                     | 1,3-DICHLOROBENZENE       | 8        | 0               | 130. (G)     | UG/L |
|                     | 1,2-DICHLOROBENZENE       | 8        | 0               | 130. (G)     | UG/L |
|                     | TRIFLUOROCHLOROTOLUENE    | 8        | 0               | N/A          | UG/L |
|                     | ETHYLENE DIBROMIDE        | 8        | 0               | 50.0 (G)     | UG/L |

## Appendix A

### DRINKING WATER SURVEILLANCE PROGRAM

The Drinking Water Surveillance Program (DWSP) for Ontario monitors drinking water quality at municipal water supply systems. The DWSP Database Management System provides a computerized drinking water quality information system for the supplies monitored. The objectives of the program are to provide:

- immediate, reliable, current information on drinking water quality,
- a flagging mechanism for 'Objective' exceedence,
- a definition of contaminant levels and trends,
- a comprehensive background for remedial action,
- a framework for assessment of new contaminants,
- and an indication of treatment efficiency of plant processes.

#### Program

The DWSP officially began in April 1986 and is designed to eventually include all municipal water supplies in Ontario; currently 44 plants are being monitored. Water supply locations have been prioritized for surveillance, based primarily on criteria such as population density, probability of contamination and geographical location.

An ongoing assessment of future monitoring requirements at each location will be made. Monitoring will continue at the initial locations at an appropriate level and further locations will be phased into the program as resources permit. It is estimated that after 4 years of operation, the program will be monitoring 90 locations.

A major goal of the program is to collect valid water quality data, in context with plant operational characteristics at the time of sampling. As soon as sufficient data have been accumulated and analysed, both the frequency of sampling and the range of parameters may be adjusted accordingly.

Assessments are carried out at all locations prior to initial sampling in order to acquire complete plant process and distribution system details, and to designate ( and retrofit if necessary ) all sampling systems and locations. This ensures that the sampled water is a reflection of the water itself.

Samples are taken of the raw ( ambient water ) and the treated water at the treatment plant, and of consumer's tap water in the distribution system. In order to determine possible effects of distribution on water quality, both standing and free flow water in old and new sections of the distribution system are sampled.

Sampling is carried out by operational personnel who have been trained in the applicable procedures.

Comprehensive standardized procedures and Field Test kits are supplied to sampling personnel. This ensures that samples are taken and handled according to standard protocols and that field testing will supply reliable data. All field and laboratory analyses are carried out using "approved documented procedures". All laboratory analyses are carried out by the MOE Laboratory Services Branch.

#### Data Reporting Mechanism

When the analytical results are transferred from the MOE laboratory into the DWSP system, printouts of the completed analyses are sent to the MOE District Officer, the appropriate operational staff and are also retained by the DWSP co-ordinator.

#### DWSP INPUTS AND OUTPUTS

The DWSP INPUTS and OUTPUTS are illustrated in Fig. 1.

#### PROGRAM INPUTS

##### PLANT AND DISTRIBUTION SYSTEM DESCRIPTION

The system description includes plant specific non-analytical information acquired through a questionnaire and initial plant visit. During the initial assessment of the plant and distribution system the questionnaire content is verified and

missing information added. It is intended that all data be kept current with scheduled annual updates.

The PLANT and DISTRIBUTION SYSTEM DESCRIPTION consists of the following seven components.

1. Process component inventory

All physical and chemical processes that the water is subjected to, from the intake pipe to the consumers' tap (where possible), are documented. These include: process type, general description of physical structures, material types, sizes, and retention time for each process within the plant. The processes may be as simple as transmission or as complex as carbon adsorption.

2. Treatment chemicals

Chemicals used in the treatment processes, their function, application point, supplier and brand-name are recorded. The chemical dosages applied on the day of sampling are recorded in DWSP.

3. Process control measurements

Documentation of in-plant monitoring of process parameters (turbidity, chlorine residuals, pH, aluminum residuals) including methods used, monitoring locations and frequency is contained in this section. In-plant monitoring results are generally not retained in DWSP but are retained by the Water Treatment Plant.

#### 4. Design flow and retention time

The hydraulic capacity, designed and actual, is noted here. Retention time (the time that a block of water is retained in the plant) is also noted. The maximum, minimum and average flow as well as a record of the flow rate on the day of sampling are recorded in DWSP.

#### 5. Distribution system description

This area includes the storage and transmission characteristics of the distribution system after the water leaves the plant.

#### 6. Sampling system

Each plant is assessed for its adequacy in terms of sampling of bacteriological, organic and inorganic parameters. The prime considerations in the assessment and design of the sampling system are:

- i/ the sample is an accurate representation of the actual water condition, eg. raw water has had no chemical treatment;
- ii/ the water being sampled is not being modified by the sampling system;
- iii/ the sample tap must be in a clean area of the plant, preferably a lab area;
- iv/ the sample lines must be organically inert (no plastic, ideally stainless steel).

It is imperative that the sampled water be a reflection not of the sampling system but of the water itself.

The sampling system documentation includes: origin of the water; date sampling was initiated; size, length and material type (intake, discharge and tap), pump characteristics (model, type, capacity) and flow rate.

#### 7. People

This section contains the names, addresses and phone numbers of current plant management and operational staff, distribution system management and operational staff, Medical Officer of Health and appropriate Ministry of Environment personnel associated with the plant.

#### FIELD DATA

The second major input to DWSP is field data.

Field data is collected at the plant and from the distribution system sites on the day of sampling. The field data consists of general operating conditions and the results of testing for field parameters. General operating conditions include chemicals used, dosages, flow and retention time on the day of sampling as well as monthly maximum, minimum and average flows. Field parameters include turbidity, chlorine residuals (free, combined and total), temperature and pH. These parameters are analysed according to standardized DWSP protocols to allow for interplant comparison.



## LABORATORY ANALYTICAL DATA

The third major input to DWSP is Laboratory Analytical Data.

Samples gathered from the raw, treated and distribution sampling sites are analyzed for approximately 160 parameters at a frequency of two to twelve times per year. Sixty-five percent of the parameters are organic. The parameters measured may have health or aesthetic implications when present in drinking water. Many of the parameters may be used in the treatment process or may be treatment by-products. Due to the nature of certain analytical instruments parameters may be measured for in a "scan" producing some results for parameters that are not on the DWSP priority list but which may be of interest. The majority of the parameters are measured on a routine basis however, those that are technically more difficult and/or costly to analyse for are done less frequently. These include Specific Pesticides and Chlorophenols.

Although the parameter list is extensive, additional parameters with the potential to cause health or aesthetic related problems may be added provided reliable analytical and sampling methods exist.

All laboratory generated data is derived from standardized, documented analytical protocols. The analytical method is an integral part of the data and as methods change notation will be made and intercomparison data documented.

#### PARAMETER REFERENCE INFORMATION

The fourth major input to DWSP is Parameter Reference Information

This is a catalogue of information for each substance analysed on DWSP. It includes parameter name and aliases, physical and chemical properties, basic toxicology, world-wide health limits, treatment methods and uses. The Parameter Reference Information is computerized and can be accessed through the Query function of the DWSP database.

An example is shown in fig. 2.

A written copy (hard version) of the Parameter Reference Information will be available in the near future and is a new and sophisticated enhancement to the DWSP.

#### PROGRAM OUTPUTS

There are four major program outputs, Query, Action Alert, Report Generation and the Annual Report.

#### QUERY

All DWSP information is easily accessed through the Query function, therefore anything from addresses of plant personnel to complete water quality information for a plant's water supply is instantly available. The DWSP computer system makes relatively complex inquiries manageable. A personal password allowing access into the DWSP query mode in all MOE offices is being developed by the DWSP group.

### ACTION ALERTS

Drinking Water quality in Ontario is evaluated against provincial objectives as outlined in the publication, Ontario Drinking Water Objectives (ISBN 0-7729-2725-1 revised 1983). This publication contains health-related Maximum Acceptable Concentrations for thirty substances. Should the reported level of a substance in treated water exceed the Ontario Drinking Water Objective an "Action Alert" requiring resampling and confirmation is issued. This assures that operational staff, health authorities and the public are notified as soon as possible of confirmation of an exceedance and remedial action taken. This report supplies a history of the occurrence of past exceedences at the plant plus a historical summary on the parameter of concern.

In the absence of Ontario Drinking Water Objectives, other agency guidelines which are documented in the Parameter Reference Information may be used. If these guidelines are exceeded the results are flagged and evaluated by DWSP personnel. An "Action Alert" will be issued if warranted.

### REPORT GENERATION

Custom reports can be generated from DWSP to meet the needs of the regions and to respond to public requests.

### ANNUAL REPORTS

It is the practice of DWSP to produce an annual report containing analytical data along with companion plant information.

FIG. 1

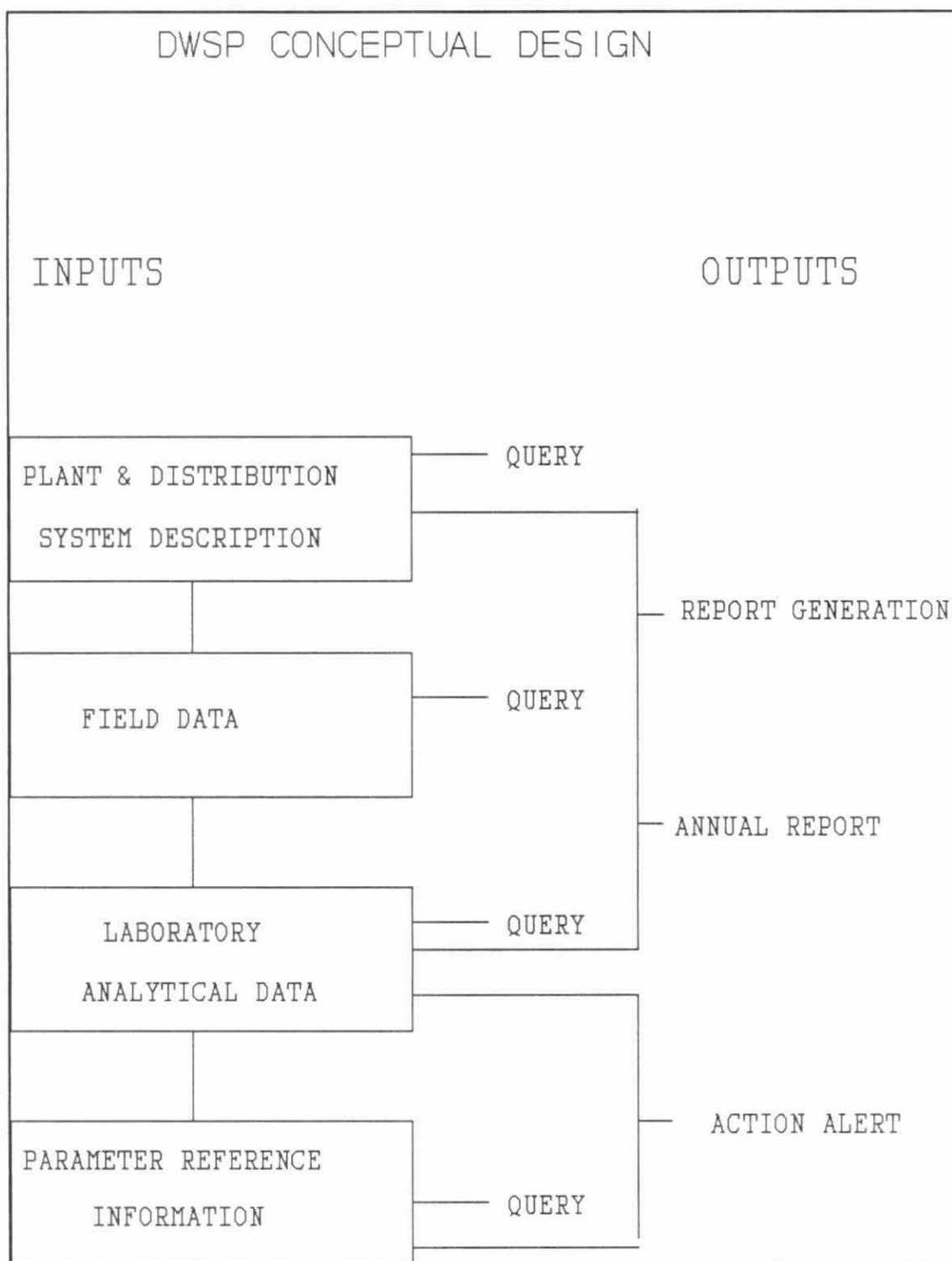


FIG.2

## MOE - DRINKING WATER ASSESSMENT PROGRAM (DWSP)

(B2001P)  
REFERENCE  
BENZENE

PARAMETER

| SOURCE | FROM    | TO | METHOD | TARG  | UNIT        | NOTE |
|--------|---------|----|--------|-------|-------------|------|
| EPA    | C 86/04 |    | NOMETH | .00   | 063000 UG/L | RMCL |
| EPAA   | C 80/11 |    | NOMETH | 6.60  | 063000 UG/L |      |
| FERC   | C 84/05 |    | NOMETH | 1.00  | 063000 UG/L |      |
| WHO    | C 84/01 |    | NOMETH | 10.00 | 064000 UG/L |      |

## DESCRIPTION: NAME: BENZENE

CAS#: 71432

MOLECULAR FORMULAE:  $C_6H_6$ 

DETECTION LIMIT: (FOR METHOD POCODO) 0.05 UG/L

SYNONYMS: BENZOLE, COAL NAPHTHA, CARBON OIL (27),  
CYCLOHEXATRIENE (41)CHARACTERISTICS: COLOURLESS TO LIGHT YELLOW, MOBILE,  
NON-POLAR LIQUID, OF HIGHLY REFRACTIVE NATURE,  
AROMATIC, VAPOURS BURN WITH SMOKING FLAME (30)

## PROPERTIES:

SOLUBILITY IN WATER: 1780-1800 MG/L AT 25 DEG C (41)

THRESHOLD ODOUR: NO DATA

THRESHOLD TASTE: 0.5 MG/L IN WATER (39)

ENVIRONMENTAL FATE: MAY BIOACCUMULATE IN LIVING  
ORGANISMS, APPEARS TO BIOACCUMULATE IN ANIMAL  
TISSUES THAT EXHIBIT HIGH LIPID CONTENT OR ARE  
MAJOR METABOLIC SITES (LIVER, BRAIN), SMALL  
QUANTITIES EVAPORATE FROM SOIL OR DEGRADE QUICKLYSOURCES: PETROLEUM REFINING, SOLVENT RECOVERY, COAL  
TAR DISTILLATION, FOOD PROCESSING, TANNING.USES: PREPARATION OF ETHYL BENZENE USED AS A STYRENE  
MONOMER, DETERGENTS, NYLON, AS INTERMEDIATE INPESTICIDE PRODUCTION, SOLVENT IN RUBBER INDUSTRY,  
DEGREASING AND CLEANSING AGENT, GASOLINE.TOXICITY: RATING 4 (VERY TOXIC); ACUTE - IRRITATES  
MUCOUS MEMBRANES, SYMPTOMS INCLUDE RESTLESSNESS,  
CONVULSIONS, DEPRESSION, RESPIRATORY FAILURE;

CHRONIC - ANEMIA AND LEUKEMIA (45).

CARINOGENICITY: HUMAN CARCINOGEN AND MUTAGEN

REMOVAL: GAC ADSORPTION, PRECIPITATION WITH ALUM  
FOLLOWED BY SEDIMENTATION, COAGULATION AND  
FLOCCULATION, SOLVENT EXTRACTION, OXIDATION (41).

MOLECULAR WEIGHT: 78.12 GRAMS

MELTING POINT: 5.5 DEGREES C (27)

BOILING POINT: 80.1 DEGREES C (27)

SPECIFIC GRAVITY: 0.879 AT 20 DEGREES C (27)

VAPOUR PRESSURE: 100 MM AT 26.1 DEGREES C

HENRY'S LAW CONSTANT: 0.00555 ATM  $M_3$ /MOLE

LOG OCT./WATER PAR.COEFF:K=1.0 1/N=1.6 R=.97 PH=5.3

## Appendix B

### DWSP SAMPLING GUIDELINE

#### i) RAW and TREATED at PLANT

|                                      |   |
|--------------------------------------|---|
| General Chemistry                    | <ul style="list-style-type: none"><li>-500 mL clear plastic bottle</li><li>-rinse bottle with sample three times and discard water</li><li>-fill to line</li></ul>  |
| Bacti                                | <ul style="list-style-type: none"><li>-250 mL clear glass bottle with white seal on cap</li><li>-do <u>not</u> rinse bottle; preservative has been added</li><li>-avoid touching bottle neck or inside of cap</li><li>-fill to top of red label as marked</li></ul> |
| Metals                               | <ul style="list-style-type: none"><li>-500 mL clear plastic bottle with white lid</li><li>-rinse bottle and cap three times, discard</li><li>-fill to line</li><li>-add 10 drops nitric acid<br/>(<b>Caution:</b> <math>\text{HNO}_3</math> is corrosive)</li></ul> |
| Volatiles<br>(OPOPUP)                | <ul style="list-style-type: none"><li>-250 mL clear glass bottle</li><li>-do <u>not</u> rinse bottle</li><li>-tilt bottle when filling</li><li>-fill bottle completely; there should be no air bubbles.</li></ul>   |
| Organic<br>(OWOC), (OWTRI), (OAPAHX) | <ul style="list-style-type: none"><li>-1 liter brown glass bottle per scan</li><li>-do <u>not</u> rinse bottle</li><li>-fill to approx. 1" from top</li><li>-when 'special pesticides' are requested three extra bottles per sample must be submitted</li></ul>     |
| Cyanide                              | <ul style="list-style-type: none"><li>-500 mL clear plastic bottle</li><li>-do <u>not</u> rinse bottle</li><li>-fill to approx. 1" from top</li><li>-add 10 drops sodium hydroxide<br/>(<b>Caution:</b> <math>\text{NaOH}</math> is corrosive)</li></ul>            |

Mercury

- 250 mL clear glass bottle
- rinse bottle and cap three times, discard then fill to top of label
- add 20 drops each nitric acid and potassium dichromate
- (**Caution:**  $\text{HNO}_3$  and  $\text{KCrO}_7$  corrosive)

Phenols

- 250 mL clear glass bottle
- do not rinse bottle
- fill to top of label as marked

Steps

1. Let cold water tap run for several minutes.
2. Record time in submission sheet.
3. Record teperature on submission sheet.
4. Fill up all bottles as per instructions.
5. Record chlorine residuals (free, combined and total for treated water only), turbidity and pH on submission sheet.

ii) Distribution Samples (standing water)

|                   |   |
|-------------------|---|
| General Chemistry | -500 mL clear plastic bottle<br>-rinse bottle with sample three times and discard<br>-fill to line  |
| Metals            | -500 mL clear plastic bottle with white lid<br>-rinse bottle and cap three times, discard<br>-fill to line<br>-add 10 drops nitric acid<br>( <b>Caution:</b> $\text{HNO}_3$ is corrosive) |

Steps:

1. Record time on submission sheet.
2. Place bucket under tap and open cold water.
3. Fill to predetermined volume.
4. After mixing the water, record the temperature on the submission sheet.
5. Fill general chemistry and metals bottles.
6. Record chlorine residuals (free, combined and total), turbidity and pH on submission sheet.



iii) Distribution Samples (free flow)

|                            |  |
|----------------------------|--|
| General Chemistry          | <ul style="list-style-type: none"><li>-500 mL clear plastic bottle</li><li>-rinse bottle with sample three times and discard water</li><li>-fill to line</li></ul>   |
| Bacteriology               | <ul style="list-style-type: none"><li>-250 mL clear glass bottle with white seal on cap</li><li>-do <u>not</u> rinse bottle; preservative has been added</li><li>-avoid touching bottle neck or inside of cap</li><li>-fill to top of red label as marked</li></ul>  |
| Metals                     | <ul style="list-style-type: none"><li>-500 mL clear plastic bottle with white lid</li><li>-rinse bottle and cap three times, discard</li><li>-fill to line</li><li>-add 10 drops nitric acid<br/>(<b>Caution:</b> <math>\text{HNO}_3</math> is corrosive)</li></ul>  |
| Volatiles<br>(OPOPUP)      | <ul style="list-style-type: none"><li>-250 mL clear glass bottle</li><li>-do <u>not</u> rinse bottle; preservative has been added</li><li>-tilt bottle when filling</li><li>-fill bottle completely; there should be no air bubbles</li></ul>  |
| Organic<br>(OWOC), (OWTRI) | <ul style="list-style-type: none"><li>-1 liter brown glass bottle per scan</li><li>-do <u>not</u> rinse bottle: preservative has been added</li><li>-fill to approx. 1" from top</li></ul>   |
| Cyanide                    | <ul style="list-style-type: none"><li>-500 mL clear plastic bottle</li><li>-do <u>not</u> rinse bottle: preservative has been added</li><li>-fill to approx. 1" from top</li><li>-add 10 drops sodium hydroxide<br/>(<b>Caution:</b> NaOH is corrosive)</li></ul>  |
| Mercury                    | <ul style="list-style-type: none"><li>-250 mL clear glass bottle</li><li>-rinse bottle and cap three times, discard then fill to top of label</li><li>-add 20 drops each nitric acid and potassium dichromate<br/>(<b>Caution:</b> <math>\text{HNO}_3</math> and <math>\text{KCrO}_7</math> corrosive)</li></ul> |

Steps:

1. Record time on submission sheet.
2. Let cold water flow for ten minutes.
3. Record temperature on submission sheet.
4. Fill all bottles as per instructions.
5. Record chlorine residuals (free, combined and total), turbidity and pH on submission sheet.

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